Administration Block.

KING'S COLLEGE HOSPITAL.

By William A. Pite [*F.*].

(*Continued from page 272.*)

MEDICAL SCHOOL.

THE Medical School faces Bessemer Road, and in its general outline is similar to the Out-Patients' Department on the other side of the Administration Block, completing the symmetry of this front. The entrance is under the connecting colonnade opposite the Resident Medical Officer's entrance in the last-mentioned block. The entrance leads into a staircase hall, with ample cloak-room and lavatory accommodation in adjacent apartments. On the right a short corridor leads to the Dean's and Secretary's Offices. Opposite the entrance a corridor running through the centre of the school gives access to the Library and Lecture Theatre, and on the south side Class Rooms and a Silence Room. An extension completing the scheme is provided for in the future. This will comprise a Museum similar in design to the Library, a Dining Room, with Kitchen and Service, and various subsidiary rooms.

LIBRARY.

The Library is a spacious and lofty room with a gallery running round three sides; ferro-concrete piers carry the roof, and small octagonal columns finished in plastolith support the galleries. A flat dome, with top light and coffered ceiling, gives opportunity for a simple and inexpensive plaster treatment. Substantial bookcase fittings of Japanese oak are provided around the room in a series of bays, thereby obtaining the maximum book accommodation.

The Lecture Theatre seating is formed on a sloping ferro-concrete gallery. A series of extract pipes are arranged in the benching, connecting with an extract space communicating with a fan-chamber on

the roof. Below the upper part of the Theatre are Lecturers' and Preparation Rooms and lavatory accommodation, reached both from the body of the Theatre and from the Library. The joinery of the Theatre is executed in Kauri pine, and a platform for the Epidiascope is arranged, with wall opposite finished as a projecting screen, sliding blackboards being placed on each side.

Upstairs is a large Pathological Teaching Laboratory, extremely well lit, also various work rooms in contiguity to the Pathological Department. A small staircase leads to a room in the turret, which is used for experimental purposes, provision being here made for the sterilisation of the cages.

Chapel Interior.

ISOLATION.

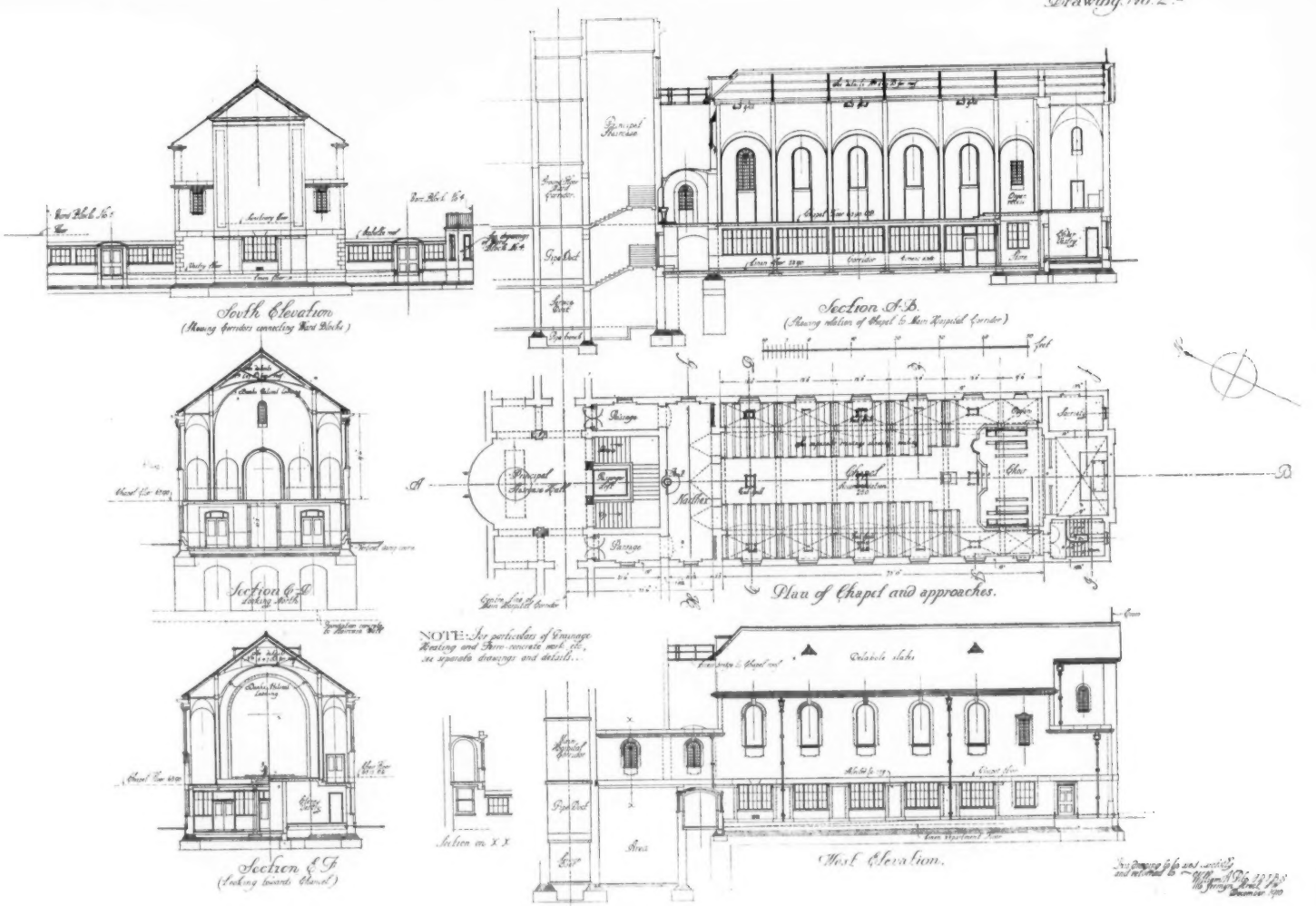
In the north-west corner of the site is the Isolation Block for Infectious Diseases. The present accommodation is for four patients, and the completion of the block will bring this total up to eight. The block is reached by a covered way from the substructure of the Special Ward Block. This block, although planned upon the same principle as the Hôpital de l'Institut Pasteur, Paris, may perhaps be considered to represent an advance on the provision of this French building.

Direct cross ventilation is secured to the cubicles by keeping the nursing corridor at a lower level, whilst a baffle plate, similar to that provided in the Observation Block, prevents air reaching one ward from another. An outside verandah encircles the building, and is available both for patients' friends and for nursing lavatory basins being installed on either side outside the cubicles. The Sink-room, Bathroom, and Lavatory are disconnected from the main block, but accessible from the verandah.

A well-fitted Duty-room, with Larder, Linen and Blanket Stores, and a Physicians' Room complete the accommodation of this self-contained unit.

THE CHAPEL.

The Chapel is placed on the central axis of the building and is entered through a narthex behind the main staircase, on the same level as the ground floor wards. It has seating accommodation for 250, a wide central space being provided for wheeled chairs. The groined roof is supported on ferro-



The Chapel: Plan, Sections, and Elevations.

concrete piers, the decorative treatment being simple and effective. The organ, pulpit, and many of the benches have been removed from the old hospital, as were the six stained-glass windows. These fittings were designed for the original chapel by Mr. Louis Ambler.

The chancel is paved with various marbles, and the altar rails are of white metal. A small sacristy is entered from the sacrarium. The narthex is separated from the chapel by three arches treated in marble and mosaic, and is entered by two doors from the corridor. In a niche is placed a picture of the Descent from the Cross. This was removed from the old chapel, and is the work of a Spanish master, Juan Baptista Juanes (1523-79). The vestries are placed under the chapel, on a level with the Linen Department, and are reached by a stair.

The position of the chaplain's quarters in the Administration Block, directly opposite the chapel, has been before alluded to.

LINEN DEPARTMENT.

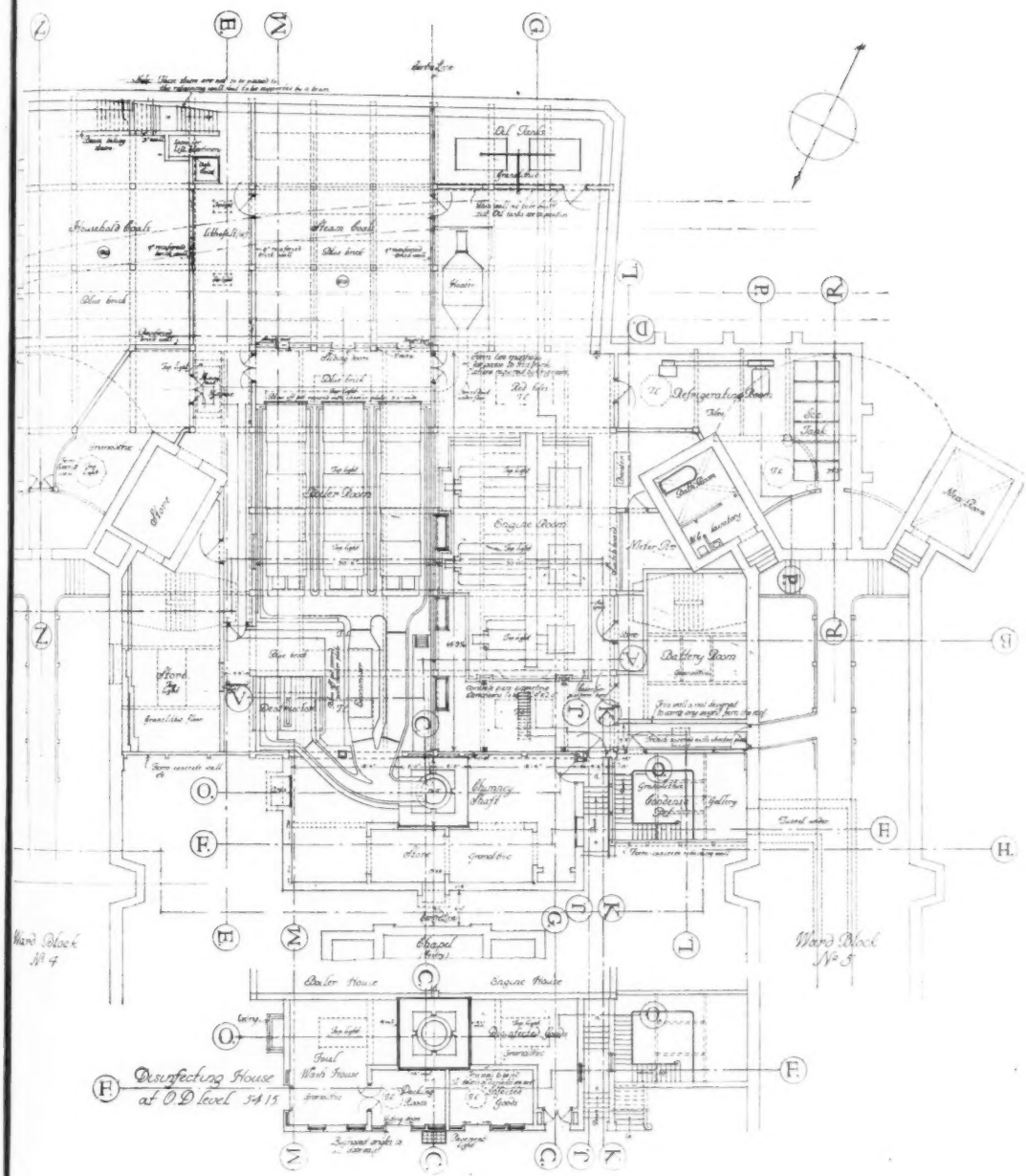
The Linen Department, under the chapel, has been mentioned in connection with its corridor forming a siding to the administrative portion of the main hospital corridor. The department is well lit and provides ample cupboard rack and counter accommodation for the sorting and distribution required. An airing room is provided, a room for uniform makers and repairs, and an office for the linen sister, in addition to the large linen and distribution rooms. Separate apartments have been provided beneath Ward Block No. 5 for the nurses receiving and distributing rooms. The hospital dirty linen is received, sorted, and dealt with in other isolated rooms beneath Ward Block No. 4.

CENTRAL STATION.

In the competitive scheme this was placed, as previously noted, in the north-west corner of the site, providing ready access for coals and stores and well removed from the wards. Many difficulties in the way of levels and drainage were here presented, and to overcome them a central position was provided. This was fixed between the two three-storey ward blocks immediately south of the chapel, as indicated by the block plan. This position has the advantage of centralising the supply and reduces the losses in distribution. Great care had to be exercised to avoid the least vibration or sound penetrating to the adjacent wards and buildings. The successful result attained in this respect is a tribute to the consulting engineers and the general construction. The whole of the accommodation, comprising boiler-house, destructors, engine-house, refrigerating plant, ice store, battery room, house and steam coals, automatic telephone exchange, condense and pump pit, stores, etc., is contained within this irregular space practically below the ground. The basements of the ward annexes are utilised as mess room and lavatory accommodation for the engineers' staff. The engine room and boiler house are 70 feet long, 30 feet wide, and 22 feet high, principally lighted from the top. These two large chambers are, however, high enough above the surrounding rooms to enable a certain amount of clerestory lighting and ventilation to be obtained. The condense pit, the floor of which is 30 feet below the ward level, is served by a tunnel constructed of arched brickwork at a corresponding level below Ward Block No. 5 and linked up with the main ducts beneath the other buildings. On a site such as this—the treacherous nature of the subsoil in this vicinity is proverbial—these works have presented considerable interest during construction. It was hoped that the flat roof space over would serve as a pleasant garden for patients' use, but this has not matured.

The boiler house, destructors, and coals are served by a sub-corridor beneath Ward Block No. 4; the engine room, together with the refrigerating plant, oil tanks, battery room, telephone exchange, with their auxiliary rooms, where dust and dirt would prove grave objections to the machinery, are distinctly separated by steel sliding doors from the former, as the plan shows, similar access being provided beneath Ward Block No. 5.

The space surrounding the base of the chimney shaft has been used for the disinfecting and fuel washing plant in separate apartments placed at the ground level and accessible from all parts of the hospital from the outside. In the foul washhouse are placed steeping tanks for disinfecting and puri-



Plan of Central Power Station.

fying the foul linen which is brought straight from the wards in sealed receptacles to which steam jets can be attached for sterilising purposes. Separate entrances and exits are provided, and the progression of the various articles towards a clean state has been the underlying principle governing the plan.

The construction of the main building is of ferro-concrete piers, with panels of 9-inch brickwork between, those to the coal stores being reinforced. The retaining walls are of brickwork.

GENERAL CONSTRUCTION AND FINISHINGS.

Economy in cost of building combined with efficiency and the economical maintenance of the structure when completed, together with immunity from fire, is the true criterion of success in a building of this character. The walls of the fabric generally are of dark, well-burnt London stocks, relieved by red dressings, Portland stone being used sparingly for quoins, cornices, &c. In the Out-Patients' Department (the first portion built) steel stancheons and joists embedded in concrete for the floors and roofs were used. The whole of the floors, flats, and stancheons in the subsequent work has, however, been carried out in ferro-concrete on the Hennebique system. The greater portion of the buildings is covered with asphalt flats, and it has been found after much experiment that a successful non-conducting blanket can be formed by laying immediately upon the concrete a layer of broken brick of small size, well punned to a thickness of about 5 inches, then screeding and asphalting thereon. In order to avoid beams in the wards, hollow floors and flat roofs have been formed of terra-cotta arched tubes embedded in the concrete. Where roofs are used the trusses are of steel, an attempt being made to render them as fireproof as possible. The covering is of green Westmorland slates, with lead hips and ridges.

Internal partitions of hollow terra-cotta are used for plastered walls, Shepwood glazed partitions being used in the sanitary annexes, where the walls are of glazed brick. The Main Waiting Hall of the Out-Patients' Department is faced inside with Hathern terra-cotta to the springing line of the barrel-vaulted ceiling. The walls throughout are, with few exceptions, lined with granite plaster finished with enamel paint. In the Medical School " Plastolith " dadoes have been used in the Laboratories and to the staircase. The Staircases generally are finished with granolithic treads and risers, with the exception of the Principal Staircase, which is finished together with the dado in grey terrazzo. The walls of the Board Room and Nurses' Dining Room are panelled to dado height in oak and teak respectively, but in no part of the Hospital is there an apartment which can be said to be so luxuriously furnished as to warrant detailed description.

Floors generally are of a plastic nature, asphalt being used in all the principal corridors and entrances and to the Out-Patients' Main Waiting Hall. Durato floors of a mottled character have been laid extensively throughout the buildings and to the margins of the wards, the filling of these latter being of linoleum. Teak wood block floors have been used in the Chapel, Board Room, Nurses' Dining Room, Secretary's Office, Matron's Quarters, Nurses' Recreation Rooms, Resident Medical Officer's Quarters, and other apartments of a similar nature. The Ward Sanitary annexes, Bath Rooms, Operating Theatres, Post Mortem Room, Lavatories, &c., are laid with terrazzo floors. The Main Entrance Hall of the Administration Block has a floor of white Roman cube mosaic, with black, white, and grey chequer borders.

The floor of the Kitchen is of red Ruabon encaustic tiles, the dado here and also throughout the Stores Department being of glazed bricks.

An interesting feature of the Operating Theatre Blocks is the use of steel door frames, which have been specially detailed and made in this country. The internal doors are flush hardwood to all the " Hospital " parts, deal enamelled doors being used in the Nurses' Home and other domestic portions of the building.

NOVEL FEATURES AND EQUIPMENT.

The Hospital does not present any special novelties in construction which call for description, rather has an attempt been made to avoid experiments in a building where hard wear and efficient maintenance at little cost are the first essentials. Walls, foundations and floors which do not settle and crack, roofs which are sound, plaster and paint free from the usual defects, joinery which shall not shrink: these are the things that matter, and effect the future condition and smooth working of such an institution. Without these attributes no scheme, however perfect in conception, can be successful. The result at King's College Hospital well justifies the time and care which have been expended on these items. There are, however, a few novel features in plan and equipment which may be found interesting to those studying hospital work.

Outpatients' Department.—A refreshment buffet has been provided in the Main Waiting Hall, where light refreshments may be served to the patients, heating and hot water being provided for dispensing tea, hot milk, &c. A sink and cupboard storage are placed behind the counter.

A perambulator shelter has been contrived beneath the Accident Entrance.

Children suffering from whooping cough are provided with a separate entrance and waiting-room; an isolation room is also available. All patients have to pass the almoner, and the considerable increase in accommodation now provided beyond the original intention of a small room well illustrates the growth of this department. The 24-Hour Ward and Padded Rooms each contain interesting features—the former comprising accommodation for both sexes, and being distinctly separated and provided as a self-contained unit. In the Ear and Throat Department there are a few items worth attention, such as the amber glazing to the Consulting and Operating Rooms, the scale of metres and feet inlaid in the floor material, the Flexwood dark blinds, and the special provision made for the treatment of adenoids. The Ophthalmoscope room in the Eye Department is a large apartment divided into cubicles, the walls being lined with black "Bickley" cement, the whole of the floor and ceiling also being finished in dull black. All corners and projections have been well rounded in order that the patients may not receive injury.

Wards.—The bays on either side of the Main Wards call for some attention; they are provided with lavatory basins, lotion bowls, sterilisers, &c., and are found in that position to be a great convenience to members of the staff. The method of running the heating and hot-water pipes in the window jambs is the outcome of much care and thought in attempting to eliminate internal pipes. Movable covers to the chases are provided for access in case of repair. The Medicine and Poison cupboards are excellent fittings, placed in the Ward and Clinical Room respectively; both are lighted by electric lamps. The improved Austral windows are placed flush with the plaster finish of the walls. They are provided with fanlights glazed with obscured glass of a special nature, which does not allow sun to penetrate, the blinds being fixed at the transome level. The Operation Room of the Eye Ward possesses a window of some interest—a recess below the cill level projecting outside and forming a pocket, into which the patient in bed is wheeled, enabling the patient's head to be brought as near the light as possible.

Operating Theatres.—An absence of all fittings with the exception of those actually required for operative purposes will be noted. The surgeons are provided with shower baths in connection with their rooms; these are found to be of great service after operating in such a high temperature, and for this purpose are preferable to the ordinary bath. The Spectators' Gallery, entirely finished in terrazzo, and the "Beck" beam light in the Gynæcological Theatre are also items of interest.

Administration Block.—All the Nurses' Bedrooms are provided with marble slabs in the corner for wash-hand basins; wardrobes are built as part of the rooms, with the usual fittings. Mirrors form the panels to the wardrobe doors in the Sisters' Rooms. All these rooms are comfortably furnished, and are well ventilated by extract flues and fanlights over doors; steel picture rails are also provided. The Nurses' Bathrooms have hot-water flushing cisterns intended to reduce wastage. The Central

Corridors are well ventilated and lit by windows at the ends, lobbies being also provided at intervals in their length for the same purpose.

The Kitchen roof is monolithic, and avoids the usual dust-collecting surfaces incidental to steel principals ; it forms an interesting example of what can be done in ferro-concrete.

The various fitments which have been specially designed for the reception of all stores, the use of scrubbers, and the numberless rooms of this department are legion, and cannot be described in detail.

Medical School.—The Library fittings are constructed in Japanese oak, which presents many admirable qualities to recommend it. The splendid figure, colour, and markings of this wood are in every way preferable to the duller Austrian oak, and more nearly approaches the fine figure of the best English varieties. The Animal Room is housed in the Eastern Turret, provision being made for the sterilisation of the cages. Slate benching is constructed all round the room, upon which rest the tubular metal supports for the cages. A gulley is provided in the floor, and provision made for hosing down.

SANITARY FITTINGS.

The fittings have throughout been specially designed for their purpose and inaugurate an entirely new era in sanitation, as the parts generally concealed from sight and liable to insanitary accretions have here been eliminated, every portion being visible and easily accessible. The following features which have been introduced merit special description. The overflows to the sinks and basins consist of an open vertical channel formed in the pottery outside. The waste outlet has no metal work, a rubber plug fitting directly into the pottery, thus dispensing with the brass grid and union joint and their attendant collection of dirt. Both the overflow and the waste discharge directly into the hopper head of a porcelain enamelled waste, which is not connected to the pottery in any way, but hinged to one of the brackets supporting the fitting, and so arranged that it can be tilted or swung to one side for inspection or cleaning. Where floor channels are not desirable the overflow and waste discharge into a porcelain enamelled hopper trap fixed on the wall and also independent of the pottery. A removable aluminium grid is provided in the trap, being also fitted with a cleaning eye for access to the waste pipe beyond.

The hot and cold valves to all fittings are of the simplest possible construction and are covered with porcelain enamel, all the fittings being easily cleaned by a damp cloth, thereby effecting an enormous economy in labour. The fittings are also constructed to build into the walls flush either with plaster or other material with a cove.

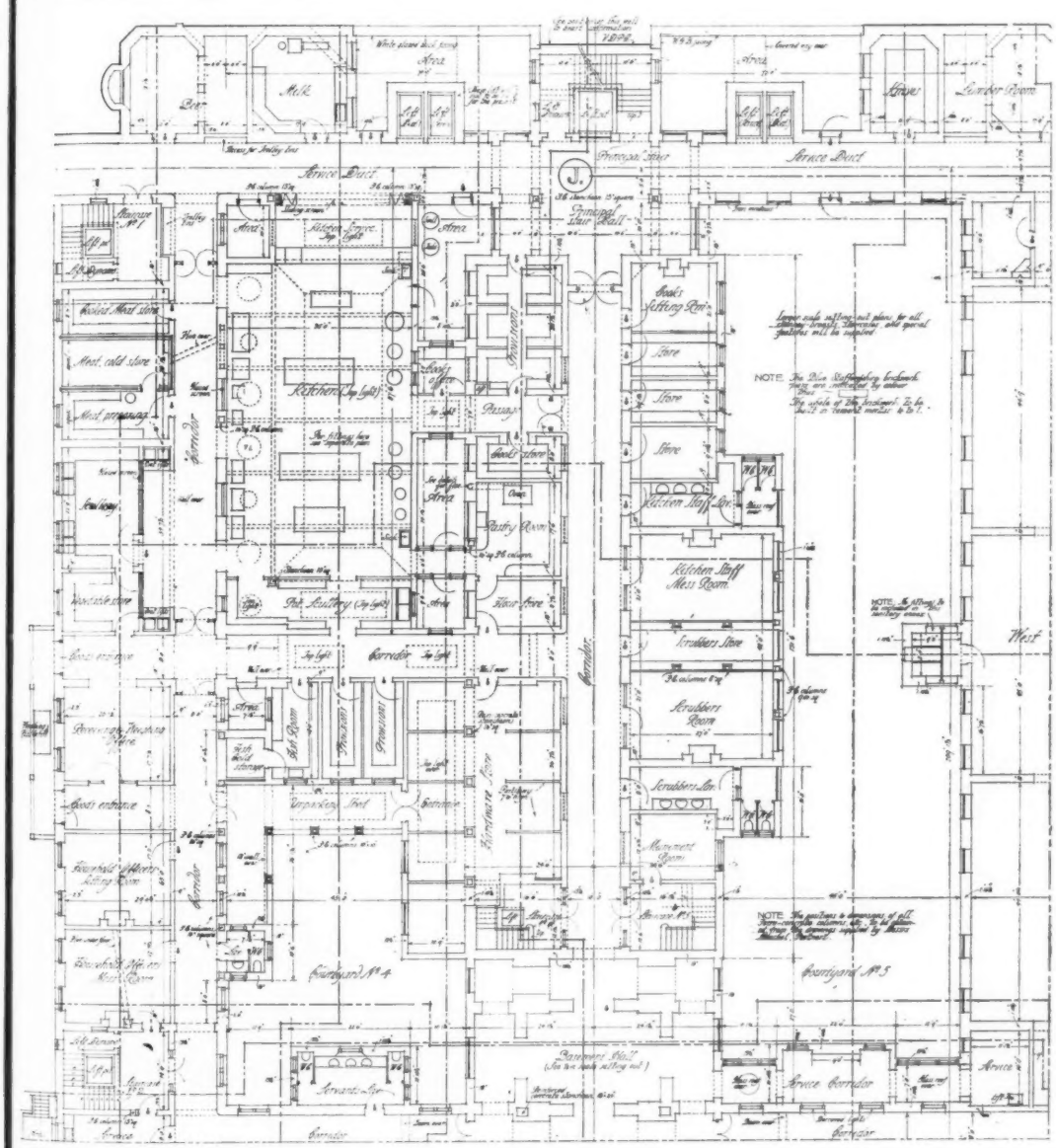
The bed-pan sinks are carried on porcelain enamelled bearers free of the wall and floor, the flush tank being divided into two compartments, one for the bed pan, the other flushing the sink. The flush for urine bottles is controlled by a porcelain enamelled weighted lever handle.

The water closets are of the shallow corbel type, with the flushing cistern immediately over the seat, where it is readily accessible for cleaning. The principles governing the design of the sinks and basins have been also applied to the baths, wherever possible metal and inaccessible parts being eliminated. The overflow and waste discharge into a channel formed in the terrazzo floor. Special lavatory basins of ample dimensions are provided in the nurses' hair-washing rooms, with mixing sprays, which can be safely regulated. Other fittings specially devised include movable baths, surgeon's shower baths, bed-pan cupboards of metal porcelain enamelled, etc.

VENTILATION.

Where possible the ventilation provided has been by natural means. In the Out-Patients' Department, where large crowds congregate, mechanical fans have been utilised to supplement the natural method : this has also been done in the Operation Theatre Blocks, Pathological Block, Medical School Lecture Theatre, and in other portions of the hospital where natural ventilation could not be relied upon. In the Administration Block all the bedrooms have been warmed and ventilated by admitting air from the corridors, to which fresh heated air is supplied past the radiators and thence through fan-

lights over the doors. Extract flues are also provided, the grating to the flues being near the floor beneath the beds. The flues all connect to the through ventilated trunk in the roof. The insertion of fans could be made at moderate cost.



Kitchen and Stores Departments.

In the Out-Patients' Department it was decided that a certain number of fans should be inserted, and these have been arranged according to the requirements of each position, either of the positive or simple propeller type. To the large Main Waiting Hall fresh air inlet ducts have been arranged under

the floor, from which fresh air is led past the radiators through gratings and baffles round the room and to the centre of the room, being incorporated with the Buffet. Openings in the ceiling connect to the trunk in the roof, where propeller fans, 5 feet in diameter, are placed, drawing the foul air from the hall and discharging it to the outer air. For the surrounding buildings roof ducts of concrete have been formed, asphalted over with communicating branches of varying diameters to suit the various rooms linked up. The openings from the rooms are in the ceilings or framework of the roof lights, gratings where possible being dispensed with in order to reduce the amount of cleaning. Electrically driven positive fans have been placed at the ends of the main ducts in special chambers, the starting and regulating switches being close by, connected by relays from tumbler switches in the rooms below; the starting and stopping of the fans being thereby under the control of the attendants below, and the speed regulation under direct control of the engineering staff.

In the Operation Theatres, in addition to the "panel" system of hot water heating, auxiliary batteries of radiators are placed in heater chambers beneath the theatres. The fresh air passes through the battery after cleansing to openings near the floor of the theatre. The foul air is drawn up into spaces provided above the ceilings and thence ejected by propeller fans. By regulation of the fans and the inlets the quantity of air for ventilation can be widely varied.

A similar system of extraction is provided to the Post Mortem Department, the usual system of fresh air passing the steam radiators, however, being adopted here. In the lecture theatre of the Medical School air is admitted through screens and passed through a battery of heaters in the roof to openings in the ceiling, the used air being then drawn out through openings under the gallery seats, and thence discharged by a positive propeller fan into the atmosphere.

DRAINAGE, WATER SUPPLY, AND FIRE MAIN.

The arrangement and superintendence of the Drainage and Water Supplies were made in conjunction with Mr. Charles T. Walrond, M.Inst.C.E., who has communicated the following particulars:

The general drainage system comprises a series of eleven main drains, running from south to north, and connecting in Bessemer Road with the public sewer, which in turn discharges into a larger sewer in Denmark Hill. Eventually there will be another main drain running from west to east to serve Ward Blocks Nos. 1, 2, and 3 that have not yet been built, and this drain will have its outfall in Denmark Hill.

A hospital, and, indeed, every large building, should possess several independent outfalls for the drains, so that in the event of any drain becoming choked, or having to be cut to provide for extensions, as small a section of the hospital as possible may be affected, and a minimum amount of interruption caused to the work of the institution. Of scarcely less importance is it that the drainage system should be periodically tested with but little inconvenience to the Staff, and reliable tests cannot be carried out in this way where a single drain serves the whole building, or even a large section of it.

Unfortunately, the Bessemer Road sewer, which was constructed not long before the preparations for the contract scheme for the Hospital were begun, was laid without reference to the characteristics of the Hospital buildings, one principal feature affecting the drainage scheme being the long main corridor crossing the drains at right angles and forming a sort of retaining wall with the ground level on the south side some 13 feet above the courtyards and basement of the Administration Block on the north side.

The effect of this sudden drop is to do away with the gentle slope of the original site towards the road, and for a distance of 250 feet from the road to substitute a stretch of courtyard and basement which is practically level. Had the sewer been laid deeper, as it no doubt would have been had the design of the Hospital been known at the time, several of the drains could have been given a far better fall than has been possible, and they could have been reduced in size.

The whole of the underground drains consist of heavy cast-iron pipes, caulked with molten lead and laid on a bed of concrete, and they have been given the best gradients which were found practicable. The pipes vary in size from 3 inches to 9 inches, and their gradients from 1 in 30 to 1 in 115.

The sewage drains are coated with Dr. Angus Smith's preservative solution, but, in the case of drains carrying rainwater only, further protection against rust has been provided by having the pipes either galvanised or sherardised.

Brick manholes have been provided in the usual way at changes in line and gradient of the drains and at points where drains join one another. The manholes are fitted at the ground level with the usual cast-iron frames and covers, and where it has been desired that the covers should be unobtrusive they have been recessed and filled in with asphalt, or stone, or whatever the material may be which forms the surrounding surface.

Frequently the brick manholes even on iron drains are provided with open channels in the floor to carry the sewage, and wherever this is done the manholes become storage chambers for foul air, and in the event of a chokage the sewage rises in them and they are converted into cesspools for the time being.

The better method is to provide the iron drains with bolted iron covers where they pass through the manholes, and by making these covers airtight neither foul air nor sewage can find its way into the manhole. This is the system which has been adopted at King's College Hospital, and the iron covers can at any time be unbolted either for clearing a chokage or for cleansing, and, if need be, disinfecting the pipes. These access covers have been freely used, and their cost may be regarded as an insurance premium against any serious interruption of the drainage system.

One great advantage of these airtight covers is that, where they are installed, a thoroughly reliable test of the drains can be made without opening the manholes, and without putting the drains themselves out of use during the process of testing for anything like the length of time that would otherwise be necessary.

The test referred to, which is known as the air test, can be conveniently applied, after closing all ventilation openings to the drains to be tested, by blowing air into the pipes through a rubber tube until the pressure, as registered by an ordinary gasfitter's gauge, is sufficient to support a column of water an inch or two in height. If the drain under test is sound, none of the air which is under pressure can escape, and the water level in the gauge remains steady. On the other hand, if there is a defect the air finds its way out, the pressure of the remaining air is reduced, and the gauge shows that the column of water it is capable of supporting is no longer as high as before. Thus the air test, equally with the water test, gives a positive result, and is not like the smoke test and the chemical test, which, when applied to a sound drain, show no result, and occasionally do the same thing when the drain is defective.

As far as possible all drains have been kept out of the pipe ducts, in order to avoid any possible risk to health from an inspection cover being carelessly left off. A few rainwater drains, however, which are trapped off from the sewage drains, have been run in the ducts, subways, and coal cellars, in which positions they are carried on iron cantilever brackets built into the wall or slung from the ceiling, or else supported on brick piers.

If drains are to be self-cleansing, not only should they be given good falls, but they must be well flushed. In order to secure this the upper ends of many of the main drains have been arranged to receive the waste water from the bathrooms in the sanitary annexes of the Ward Blocks, and the baths have been fitted with large outlets so that they may empty quickly.

Those drains which could not be flushed by means of baths have, where it seemed desirable, been provided with flush tanks, which slowly fill with clean water from the main and then automatically give a rapid discharge. Such tanks, for instance, have been fitted in the sculleries in order to break up and get rid of the grease, for grease, when it is allowed to solidify in the drains, often causes trouble.

Every drain, after being laid and before being covered up, was tested with water by means of a standpipe carried up to 25 feet above the level of the floor of the main waiting hall, the object being to prove that it was quite sound under a greater pressure than it would be subjected to in actual use. After the drains had satisfactorily passed the water test, the air test was applied to them in the way already described.

On the completion of each block the air test was reapplied, and it is specified to be applied for the third time just before the sanitary work is finally taken over and the contractor's responsibility for it ceases.

In order to reduce the amount of plumbing work to a minimum, where practicable, all baths, sinks, and lavatory basins have been arranged to discharge into surface channels in the floor.

In some cases it has been found feasible to give the whole floor a slight fall to the channel, and the convenience of this when using a hose and squeegee for cleaning is obvious.

Each floor channel is laid to a fall, and the outlet at its lower end is connected to a 3-inch white enamelled cast-iron trap, which discharges into a gully in the open air. The inlet to the trap is protected by a very open grating of aluminium, which, unlike the ordinary pattern, allows it to be readily seen whether the trap is clean or not, inspection being further facilitated by the white enamel.

In order to keep the traps in view, care has been taken not to place them immediately under a sink or basin.

Ordinary white enamel as applied to cast-iron is somewhat easily acted upon by acids which are used in hospital practice, and, therefore, a special enamel capable of resisting strong nitric and hydrochloric acid has been employed in coating the traps.

Each main drain is separately trapped off from the sewer in a disconnecting manhole at the Bessemer Road boundary. The pattern of intercepting trap adopted is the "Renor," which possesses the advantage of allowing any obstruction in the trap being removed from the sewer side, an operation which is usually impossible. The traps, like the drains, are of cast-iron.

The main drains are ventilated independently of one another, a fresh air shaft being provided at each disconnecting manhole.

The inlet heads to the fresh air shafts are fitted with mica flaps arranged on vertical pivots, instead of being suspended, as is usually the case, from their upper edges. This form of flap is more sensitive than the ordinary pattern.

The life of a mica flap is sometimes a short one, in consequence of its vibrating rapidly against the grating upon which it closes. The vibrations are due to the fluctuations in air pressure in the drain close to the intercepting trap when much water is passing. Two methods of guarding against this have been adopted, one being, where possible, to prevent pressure variations arising, and the other to restrict the variations when they do occur within fixed limits. By running a branch drain off the disconnecting manhole and ventilating its upper end no air pressure worth consideration can take place in the drain, because the branch at once relieves it. This is how the first method is applied. The second method consists in bridging or short-circuiting the "Renor" trap by a pipe with an adjustable aluminium valve upon it. The valve, though normally closed, opens to allow air to pass from the drain to the sewer, but remains closed against any air which tries to pass from the sewer into the drain.

Soil Pipes.

The soil pipes are constructed, generally speaking, of cast-iron, with inspection doors at bends and junctions to allow of the ready removal of any obstruction and for thorough cleaning and disinfection. The upper or ventilating ends of the soil pipes, where taken up the slopes of roofs, are, chiefly for appearance sake, in lead. In some cases it was not easy to decide where the soil pipes should terminate owing to the proximity of windows, skylights, ventilating shafts, and chimneys, especially as they could not be allowed to show too prominently.

In the case of the sanitary annexes to the Ward Blocks the ventilating pipes have been grouped together in the roof and carried up side by side as a finial, which, unless carefully scrutinised, would not be thought to have any connection with the drainage system, but to be merely an architectural feature. All soil pipes were tested before the closets and slop sinks were fixed by being filled to the top with water, and after the fittings had been connected to them they were tested with air.

Main Waste Pipes.

The main waste pipes are of galvanised cast-iron, and, to provide against the injury that is frequently caused by the passage of hot water, they have been fitted with expansion joints.

The ventilating portions of these pipes, where carried up the slopes of roofs, have been treated like the soil pipes and extended in lead.

In some cases it was found necessary to carry the pipes across a flat or some open space, and here resort was had to galvanised wrought-iron pipe on account of its greater strength and its neater appearance.

The waste pipes, including the traps of the floor channels, were tested with water and with air like the soil pipes.

Water Supply.

The Hospital authorities decided against having their own well and in favour of obtaining their supply from the mains of the Metropolitan Water Board.

The Board have a 16-inch high-pressure main in Denmark Hill with a pumping station at one end and a reservoir at the other, and this main was cut opposite the Hospital buildings, and a sluice valve inserted upon it. A connection was then taken off the main from each side of the valve and brought into the Hospital buildings.

If this main were ever to burst, the fault would of necessity be on one side or other of the 16-inch valve, and, if it were to take place on the reservoir side, the valve would be closed and the supply obtained from the pumping-station. If, on the other hand, the burst occurred on the pumping-station side, the valve would be closed and the supply drawn from the reservoir. It will thus be seen that there is very little risk of the Hospital being left for more than a few minutes without a full supply of water; but to make matters trebly safe, at the suggestion of the Water Board, a third branch has been run from the Board's low-pressure main in De Crespigny Park, which would come into operation supposing that anything so unlikely as two bursts at the same time occurred on the Denmark Hill main. Virtually, therefore, the Hospital has three independent sources of supply. The Board's meter is placed inside the Hospital, instead of in a manhole in the road, and a recording pressure gauge has been fixed close to it, so that a permanent continuous record may be kept of the pressure.

In order to carry out the instructions of the Building Committee, that every cold water fitting throughout the Hospital should be supplied off the main direct, the Hospital water main had to be large enough to supply all the buildings during that period of the day when water, both hot and cold, is in greatest demand, and, although there was no difficulty in ascertaining from the records of other Hospitals of similar size what total amount of water would probably be used per diem, no data of the maximum consumption during any given hour of the twenty-four were available, and the problem of the size of main to be adopted did not lend itself to any form of accurate calculation.

The main is of cast-iron, and varies in size from 10 inches to 4 inches. All branches over 3 inches in diameter, and all branches buried in the ground, are cast-iron, but the remainder, with few exceptions, are wrought-iron. The cast-iron pipes are jointed with molten lead, no yarn being used in the joints. Sluice valves have been provided on all branches, and provision has been made for a water meter to be readily placed on any branch, so that the consumption in any part of the Hospital may be ascertained when desired.

The amount of storage of cold water to be provided was fixed by the Committee at 20,000 gallons,

and this volume is contained in a pair of cisterns constructed of riveted steel boiler plates, and situated in the Tank Houses on the roofs of the two centre Ward Blocks.

The cisterns are each 14 feet high and 13 feet in diameter, and take the form of closed tanks, and access to them is obtained through manholes on the top, which are fitted with airtight covers. They are painted internally with "Siderosthen," and the connecting mains are provided with valves so that in the event of any interruption to the supply from the Water Board's system the cisterns can be made to serve the whole network of cold water pipes in the Hospital.

The specified hydraulic test for the water mains and services is 120 lb. per square inch at the ground level near the main entrance.

Fire Main.

The fire main and its branches are supplied from the Water Board's high-pressure main already referred to, and the same threefold precaution against failure in the domestic supply has been adopted in regard to the fire service.

The main runs through the pipe subway and basement, and the branches rise from it to the hydrants on the different floors.

The hydrants are of Messrs. Merryweather's "Metropole" pattern, the handwheels being of cast-iron, in order to reduce the quantity of bright gun-metal, which needs polishing, to a minimum.

Below each hydrant is a 1½-inch cock for filling fire buckets.

The fire main and its branches were tested under a hydraulic pressure of 200 lb. per square inch.

For the drainage work as well as for the water mains and services and the fire mains throughout the Hospital, with the exception of the Out-patients' (and Casualty) Department, Messrs. Matthew Hall & Co. were responsible as sub-contractors, under the general contractors, Messrs. Foster & Dicksee; Messrs. Doulton being the sub-contractors for the corresponding work in the Out-patients' Department.

ENGINEERING PLANT.

The design, arrangement, and superintendence during construction of the engineering plant and equipment were entrusted to Professor D. S. Capper, M.Inst.C.E., of the firm of Messrs. Kirkland & Capper, consulting engineers, who have communicated the following particulars:—

The engineering requirements of the hospital are of considerable extent and include plant for heating, ventilation, domestic hot water supply, sterilising, disinfecting, refrigerating, electric light and power for lifts, fans and other requirements, refuse destruction, gas supply, cooking, telephones, bells and clocks, and dispensary machinery.

Main central plant is installed, so that the hospital is entirely independent of external sources of supply and has everything under its own control with the exception of the gas supply.

Main Generating Plant.

The Central Station containing the main generating plant is situated about the middle of the south side of the hospital, immediately between Ward Blocks Nos. 4 and 5. This position has the advantage of centralising the supply as nearly as possible, with consequent reduction in distribution losses.

The Central Station consists of engine room about 70 feet long by 31 feet wide, and boiler room about 70 feet long by 30 feet wide, the spaces between these two main rooms and the Ward Blocks on either side being divided up into stores and rooms which are occupied by the auxiliary plant, including pumps, electric storage battery, main refrigerating plant, telephone exchange, and repair workshop.

The power station is partly sunk below the general external ground level. One portion of the roof stands above this level, while the remaining portion covering the coal and oil stores is kept to the ground level to enable fuel to be readily delivered into the stores beneath.

It having been decided, after careful consideration, not to obtain steam and electricity from an outside source, it was resolved to instal Diesel oil engines for driving the electric generators and Lan-

cashire boilers for supplying the steam for the heating and hot water services. One of the factors which determined this combination was that if a well should have to be sunk to provide water for the hospital, the hardness of the well water would be detrimental to the boilers if the larger quantity of make-up feed required for steam engines were used without previous softening. To further reduce the quantity of make-up feed water, electrically driven plant has been installed for the auxiliary machinery, which has the added advantage that no special provision has to be made, as with steam-driven plant, for separating the lubricating oil from the steam discharged from the pumps before it enters the heating system.

Also, the steam plant has been designed so that all condensed steam should be returned to the boilers, the only exceptions being in instances where the steam is contaminated by contact with vegetables in steamers, foul articles in disinfectors, etc., in which cases it passes directly to the drains of the hospital.

Three Lancashire boilers, each 30 feet long by 7 feet diameter, are provided. These supply steam for warming the building and for heating water for domestic supply, as well as for sterilising, disinfecting, and cooking purposes.

The stoking floor level is the same as that of the steam coal stores, openings into which immediately face the furnace doors to facilitate stoking. Coal is delivered directly from the roadway above on to the stoking level, so that handling of coal is reduced to a minimum. All coal, before it is delivered into the steam coal stores, which have a capacity of about 220 tons, is weighed on a weighbridge placed on a roadway leading to the Central Station.

The air supply to the Crosthwaite furnaces is supplied by an electrically driven fan, the air being warmed by the hot gases discharged from the Diesel engines. An alternative arrangement is provided by a steam blast.

The flue gases from the boilers pass through an economiser on their way to the chimney, and thus economically heat the water fed to the boilers. This economiser consists of 120 tubes, the outer surfaces of which are kept clean of soot by means of electrically driven scrapers. Close to the economiser is placed a furnace for destroying the refuse from the hospital, the flue from the destructor entering the main boiler flue at the back of the economiser. Ashes are taken from the boiler room by means of an electrically driven hoist to the ash store, which is at the level of the roadway above, thus facilitating their removal by the municipal authorities.

The engine room is adjacent to the boiler room, and the three dynamos therein are driven by Diesel oil engines. The total horse-power is about 350, and the current is supplied to the hospital at a pressure of from 100 to 110 volts.

All the engines and dynamos are placed on a reinforced concrete bed made in one solid block, insulated by ashes from the surrounding soil so as to reduce to a minimum the danger of vibration or noise penetrating to the adjacent wards. The gases discharged from the engines pass either directly to the chimney or through the air heater for the boiler furnaces already mentioned, valves being provided to direct the gases in either direction. Six main cylindrical oil fuel storage tanks are provided. These can be filled directly from the roadway.

Oil is pumped by a hand pump from these tanks to auxiliary feed tanks close to the engines. Independent starting arrangements are provided for each engine, but are inter-connected so that any one starting vessel can be used for starting any engine, thus reducing to a minimum the danger of stoppage due to any starter failing.

The main switchboard which controls the whole of the electric current throughout the hospital is placed in the engine room directly under the control of the engine driver, and a battery of 50 cells of sufficient capacity to carry the hospital over any ordinary engine breakdown period is placed in a room at the back of the switchboard. This battery during ordinary normal working is used as a regulator to supplement the current supplied from the dynamos and steady the supply at times when sudden demands arise in the hospital.

A 5-ton overhead travelling crane runs on rails stretching from end to end of the engine-house to facilitate the carrying out of repairs.

The refrigerating plant consists of machinery for manufacturing ice and for cooling various rooms, such as the cold meat store and mortuary. The ice store is close to the main refrigerating plant, thus enabling the ice blocks to be delivered directly from the refrigerating tank to the store by an overhead runway, for distribution throughout the hospital.

Owing to the exigencies of the site, the pump room is sunk to a level about 13 feet below that of the engine room floor. This enables a gravity return from the steam mains to be utilised and avoids the use of isolated pumping plant which would otherwise have been necessary, and enables the whole of the working machinery to be under the control of the engine room staff.

The ducts through which the return mains reach the pump room from the hospital are graded downwards to the pump room, so that in the event of a leakage in the pipes the water can run down to the pump room, where it is collected in a sump, from which it is pumped by an automatic electrically driven drain pump into the general drainage system of the hospital, which is at a higher level than that of the pump room floor. A steam ejector is also provided for use in the event of the breakdown of the electrical pump.

The whole of the electric motors for the pumps are controlled from a switchboard placed on a gallery round the upper part of the room on the engine room floor level.

Heating Plant.

The system adopted for heating the hospital is by low-pressure steam, passing through radiators and heating coils, the condensed water draining back to the pump room, where the return mains are connected through a condenser and vacuum pumps to the main feed tank, from which the feed pumps deliver the water through the economiser to the boilers.

The whole of the main supply and return pipes for the heating system are carried in ducts constructed below the basement floors of the building, these ducts, wherever possible, being made of sufficient size to give easy passage from end to end to facilitate inspection and repairs. Where the ducts could not be made large enough for this purpose, openings with removable covers have been provided in the floors at frequent intervals, so that all vital portions of the pipes are accessible. The vertical pipes rising from these ducts to supply the radiators are as far as possible run so as to avoid obstructing the rooms.

In the Administration Block the pipes are fixed to the walls outside the building, only the branches connecting them to the radiators passing through the wall. Special care was taken with the coating of these exposed pipes to reduce condensation losses to a minimum.

In the Ward Blocks the external window jambs have been utilised by making the vertical splays hollow with the pipes placed within. The outside faces of the splays are removable so that access can be obtained to any of the pipes. These arrangements enable the floor beneath the radiators to be kept entirely free from obstruction by pipes, thus facilitating cleaning, and the main pipes being outside the building prevents the necessity of workmen entering the wards should any repairs be required to them. Generally, the radiators are placed under the windows with inlet ventilating openings behind them, baffle plates being fitted to the radiators to deflect the incoming warmed air so that it rises up over the surface of the windows, thus enabling ample ventilation to be provided by natural means as far as possible without draught. The radiators, with a few exceptions, are of the hinged "Astro" pattern, so that the walls and ventilating openings behind the radiators can readily be cleaned and kept free from dust. The section of the radiator adopted was specially designed for the hospital, so as to be entirely free from projecting or recessed surfaces, to facilitate cleaning and reduce the deposit of dust to a minimum.

The ventilating openings behind the radiators are provided on the inner surfaces of the walls with specially designed baffles of the hinged louvre type, the whole framework containing the louvre being

likewise hinged so that it can be easily lifted up and the opening behind thoroughly cleaned. In the few cases where it was found necessary to use fixed radiators, a specially designed ventilator, with a single hinged flap covering the whole of the opening, was provided. The flap is arranged so that it can be turned right back or completely removed to enable the ventilating opening to be cleaned by a brush passed between the radiator sections. All radiators are fitted with special relief valves and dirt pockets.

In certain cases, principally in the basement and Laboratories, uncovered pipes carried round the rooms near the ceilings are fixed instead of radiators.

This system of heating has many advantages for such positions, as it leaves clear floor and wall spaces, and avoids the occupants having to sit close to heating surfaces, at the same time giving efficient results. The principal heating of the wards is effected by open hearth ventilating stoves placed in the middle of the floors towards each end of the wards, a few radiators being fixed to supplement the heat from the stoves during specially cold weather. Provision has been made so that the number of the radiators may be readily increased should they at any time be required.

The main Operation Theatres are heated on a somewhat different system. The special conditions to be met in these cases were that heat is required both in summer and in winter, that only such obstructions as are absolutely unavoidable should be allowed, and that the room should be capable of being well heated to a high temperature in a very short time and well-ventilated. To meet these conditions, cast-iron radiators are dispensed with, the heating being carried out on the panel system, which consists of small-diameter pipes attached to the walls and ceilings and covered with Durato plaster, which has an expansive co-efficient similar to that of the pipes. Heat for these panels is provided by means of hot water circulated from steam-heated calorifiers placed in the basement of one of the blocks, a separate steam main supplying these calorifiers to enable them to be used at any period of the year.

The calorifiers have special temperature-regulating valves, so that the water which is passed through the panel pipes should not exceed 160° F. Further, the panels are arranged in sections, which can be cut off individually, so as to regulate the temperature within wide limits. By these means the walls and ceilings of the theatres can always be kept warm. To give the additional heat required when an operation takes place, and at the same time to allow the rooms to be well ventilated, fresh air is introduced after being warmed by passing over auxiliary batteries of radiators placed in chambers underneath each theatre, the air being cleansed by passing through screens both before and after traversing the heating batteries. The circulation of this air is rendered positive by means of extract fans placed in the roof, which also enables the amount of air supplied to the theatre to be regulated as required.

The valves for controlling the panels and auxiliary batteries and the switches for the fans are placed in one of the rooms adjacent to the theatre, so that the operation theatre itself is, so far as the heating and ventilating systems are concerned, clear from projections on which dust can lodge. This also applies to the hot and cold water and sterilisation arrangements, as these services are provided in an adjoining room.

Hot Water Supply.

Hot water is provided from steam-heated calorifiers placed in the engine room. The pipes to the various points at which the service is required in the building are arranged on the drop pipe system. The main flow pipes run from the calorifiers to tanks placed in the roof of the Ward Blocks on each side of the power station. From these tanks pipes are run through or on the roofs of the several departments of the hospital, and connect with drop pipes which run to the basement, supplying on the way the various draw-off points. These drop pipes are collected together in the basement and returned through the ducts to the calorifiers. The main return pipe passes through the pump room, where it is connected with an electrically driven circulator for assisting the circulation.

The water supply to the calorifiers is drawn from a cold water tank connected to the water com-

pany's mains or from the circulating water discharged from the Diesel engines when they are working. The heat discharged in this circulating water is thus utilised in the hot water service, instead of being run to waste. The heat discharged in the cooling water from the condenser in the heating system is similarly used. Each calorifier has a storage capacity of 850 gallons, and is capable of providing 3,000 gallons of water per hour at a temperature of 180° F.

Several pieces of apparatus were specially designed to prevent waste of hot water, thus :

In all the bathrooms of the Administration Block hot water is supplied to the baths through waste preventer tanks, which are kept constantly hot by a circulating coil from the hot water system passing through them. Each tank contains sufficient hot water for a bath, and its contents are discharged by a single pull, ensuring an adequate supply without that waste which may occur by hot water being turned on and left running. The pipe filling the tank is provided with a valve, which can be set to fill the tank in any desired time.

In the ward kitchens, the linen rooms and patients' clothes rooms certain services which are required both summer and winter are heated by the hot water system to enable the steam-heating mains to be closed down in summer. Such services are, for example, the hot serving closets in the ward kitchens and elsewhere, the heating coils in the linen rooms and patients' clothes rooms, the towel and blanket rails and the bed-pan racks, &c., in the wards and operating theatres. In the ward kitchens boilers are fixed for tea-making, milk-warming and egg-boiling purposes, for which the water is heated partially by hot-water coils and partially by electricity, thus greatly economising electricity. The egg and tea boilers are interchangeable in case of breakdown, and into either of these milk saucepans or egg poachers can be inserted, so that a variety of work can be obtained from the same apparatus. The hot-water bottles for the wards are stored in specially designed tanks filled with water kept constantly hot by coils from the hot water system, so that the bottles are immediately available for use, and the work of refilling them is entirely avoided.

Kitchen Plant.

The main Kitchen is provided with steam and gas appliances. Gas is used for the ovens and grills and steam for the boiling pans, serving and carving tables. The gas ovens are provided with a special safety device, so arranged that any explosion inside the oven will open hinged covers in the top and allow the escape of the exploding gases without risk of injury to those in attendance. A gas hot plate is attached to the grills, and the burners are so arranged that on placing the cooking utensils over them the gas is turned full on and lit by a by-pass, but on the utensils being removed the gas supply is cut off automatically with the exception of the by-pass, thus economising gas.

The steam-heated boiling pans are fixed on cantilevers in the walls, so as to free the floors from obstruction and render them easy to clean. The discharge from the steam spaces of these boiling pans is arranged so that the steam passes directly into the heating system of the hospital, and the condensed water escapes to the return main, thus utilising all the waste heat possible. A similar arrangement is adopted for the steam-heated serving and carving tables.

In the potato and vegetable steamers the steam comes into contact with the food to be cooked, and is therefore passed directly into the drains.

Electrically driven machines are provided for paring potatoes, cleaning knives, washing plates and crockery generally, and in addition a hand bacon slicer is provided. Special apparatus for Pasteurising the milk for the children's department is also installed.

The steam supply for the Kitchen is connected with the separate steam main already mentioned as supplying heat for the Operation Blocks. This main is also used for the Dispensary plant and for disinfecting and sterilising purposes. The steam pressure in this main is 50 lb. per square inch, which is reduced as required.

Dispensary Plant.

Plant for distilling and preparing drugs, tablet making, soda water manufacture, &c., is installed. Steam is supplied to the boiling pans and stills, and the machinery is electrically driven.

Sterilising Plant.

In the Out-Patients' Department and in the wards the instrument sterilisers are heated by electricity. In the main Operation Blocks steam-heated sterilisers are installed for dressings, surgeons' coats, instruments, hot and cold water, &c.

Disinfecting Plant.

A steam disinfector is provided to deal with mattresses and other large articles. This disinfector is placed between two rooms, one of which is used for receiving the infected goods and feeding them to the disinfector. The goods after disinfection are withdrawn from the disinfector into the other room, thus ensuring that infected and disinfected goods do not come in contact.

Laundry.

The hospital decided that all goods should be washed in a laundry outside the hospital, and that all foul and infected goods should first be sterilised in the hospital before being sent to be washed. The arrangements they required for doing this consist of steeping tanks for disinfecting and purifying the foul linen brought from the wards in sealed receptacles, the tanks being provided with steam jets for boiling the contents when required. A steam jet is also used for sterilising and cleaning the receptacles in which the infected goods are brought to the washhouse.

Ventilation.

As far as possible the ventilation of the hospital has been provided by natural means, as already described under Heating, but in a number of cases it has been found advisable to supplement this by electrically driven fans. In the Out-Patients' Department, where cases of special difficulty in obtaining complete ventilation by natural means occurred, a certain number of fans were inserted and arranged according to the requirements of each particular position, either of the positive or propeller types. An instance of this is the Main Waiting Hall, where large numbers of people will at times be assembled, the Hall being surrounded on all sides by consulting rooms and other buildings. In this case fresh air inlet ducts have been arranged communicating with openings in the floor immediately under radiators, the openings being arranged round the walls of the room and in enclosures in the Refreshment Buffet in the middle.

Extract openings are provided in the ceiling and communicate with the hollow roof, in which are placed propeller fans 5 feet in diameter. These fans draw the foul air from the Hall, and ensure a circulation of fresh-warmed air through the Hall. The rooms surrounding this central hall are provided with fresh-air inlets admitting air behind the radiators. For extract purposes the rooms are collected into five sections, each section having on its roof a main duct into which openings are made from the rooms, through the ceiling or the framework of the skylights. Gratings, except where absolutely necessary, are dispensed with to allow the free passage of air and to reduce the amount of cleaning required. The air is extracted from the rooms through these main ducts by fans placed in special chambers on the roof, from which it is discharged to the outer air. These positive fans are automatically controlled, so that they may be started or stopped by switches placed at convenient positions in the corridors or rooms below.

In the Administration Block all the Nurses' and Staff bedrooms are supplied with warm air from the corridors. Fresh air enters the corridors, in which it is heated by radiators, and then passes into the rooms through fanlights over the doors. Extract openings are arranged near the floor underneath the beds, and communicate with upcast shafts leading into the hollow roof, from which the air

is discharged to the outer air through openings so designed and prepared that fans may be inserted if required.

The Kitchen is ventilated by extract fans drawing from openings distributed round the Kitchen roof and discharging above the main roof of the hospital; the position of the Kitchen, which is a one-storied block placed in an area surrounded by bedroom and office blocks, rendering prevention of smell of paramount importance. The gas ovens and boiling pans are ventilated into this same system by vertical shafts.

The Lecture Theatre of the Medical School is ventilated and warmed by means of air admitted through screens and a battery of heaters placed in chambers on the roof and connected with inlet openings in the upper part of the room. The air is extracted through openings under the seats of the auditorium and discharged by a positive fan into the outer air.

In the dark rooms of the X-ray and other departments special light-tight ventilators have been provided, admitting air, but excluding all light.

Electricity Supply.

The electric supply mains from the main switchboard in the generating station to the sub-switchboards in the various departments of the hospital have been carried through the tunnel and ducts already mentioned, and are of bare copper strip supported on porcelain insulators. Great care has been exercised to protect these mains from any risk of short circuiting and injury, and where any chance of contact arises special guards have been inserted. Access to the ducts along which these bare leads are carried is only permitted to authorized persons.

Vulcanised india-rubber insulated conductors are led from the sub-switchboards to the lighting and power points, and enclosed, either in special half-round section wooden casing on the surface, or in steel tubing buried in the walls in cases where it was necessary to keep the wall surface free from projections.

The power requirements of the hospital are considerable, including current for the auxiliary electric plant in the main generating station, electric ventilating fans, lifts, sterilisers, motors for kitchen plant and for the blower for the organ in the chapel, as well as for X-ray and other electro-medical apparatus. The mains are so arranged that the power and lighting loads can be separately measured, as can also the load for the pilot and external lights throughout the building.

All switch and fuse boards are mounted on white marble blocks, and enclosed in teak cases provided with glass fronts, the cases being of special design with a top sloping at 45° to the wall so as to facilitate cleaning and render any dust deposited readily visible. Great care was taken to design all fittings, whether pendants, brackets, plugs or switches, of a form which can be easily cleaned and allow the least possible projection on which dust could collect.

In the wards the Medical Staff required a bracket light over every bed, and under each of these brackets is fixed a plug socket so that when a patient is being examined a hand-lamp can be used without the flexible connection trailing across the floor. The bronchitis kettles, as in the case of the instrument sterilisers, are heated electrically.

In the Operation Theatres special lighting fittings for the operating tables were designed: that in the Out-Patients' Department Theatre being arranged so that it can be lowered to enable every portion of it to be readily cleaned.

For the Gynæcological Theatre a powerful arc lamp searchlight is fitted outside the theatre, and projects a beam into the room through a window, fitted with a cooling chamber on to mirrors, from which it can be directed to any required part of the patient under operation. The beam may be either concentrated or diffused by a simple adjustment of the mirrors.

Brackets of special design have been fixed on the walls of all Operating Theatres to provide auxiliary lighting, and in addition provision has been made by flush plugs of suitable amperage for supplying current for cauteries, cystoscopes, and other electro-medical appliances.

Electric Lifts.

The electric lifts are all of the push-button type, rendering attendants unnecessary. To avoid risk of accident special precautions have been adopted. The lift cages are made to fit the wells, and the wells themselves have been made flush from top to bottom, so that when the cages are passing the doors there is no projection from which accident can arise. The gate locks have been specially designed so that the risk of pinching the fingers when opening and shutting the Bostwick gates is eliminated. In addition to the usual precaution, which prevents the working of the lift when any door is open, and will not allow the door to be opened unless the cage is opposite to it, special arrangements are made to ensure that when a person is using the cage no one can interfere with the working of the lift until that person has left it and shut the gate on the landing.

Lifts are provided for passengers, beds, food, and general service. In all there are ten electric lifts and two hand lifts, provision being left for additions if required.

Telephones, Bells, and Clocks.

The telephone exchange room adjoins the main battery room, and contains the electric control mechanism for the inter-communicating telephones in the hospital. This plant is of a type which requires no operator, inter-communication being obtained entirely by automatic means. A subsidiary battery for operating the telephones, as well as the clocks, which are also electrically controlled, is placed in the main battery room. The master clock is in the telephone exchange room, and controls the 120 clocks in the hospital. The electric bells are also controlled from the same battery as the clocks and telephones, instead of from isolated batteries scattered about the hospital.

In connection with the electric bell system ten automatic indicators are installed which show at convenient places in the hospital the arrival and departure of members of the Staff. These are operated from the porter's office in the entrance hall. A special device has been adopted in the Nurses' quarters of the Administration Department for awakening the nurses. A gong is placed in each bedroom corridor, and all these are controlled from one board placed in the Matron's office. This board is provided with two sets of pushes and a set of small lamps. On pressing one push the lamp corresponding to it is lighted, and so remains until the second push is pressed to stop the bell. In this way complete control is given to the Matron.

DISCUSSION ON THE FOREGOING PAPER.

Mr. Alfred W. S. Cross, M.A.Cantab., *Vice-President*, in the Chair.

The CHAIRMAN, in opening the discussion, said they were all very much obliged to Mr. Pite for his most able and illuminating address on the very fine hospital he had designed. They were honoured on this occasion by the presence of several distinguished guests who were interested in hospital construction generally and in the building under discussion in particular, and he had much pleasure in calling upon the Rev. Arthur C. Headlam to propose a vote of thanks to Mr. Pite.

The Rev. Dr. HEADLAM, formerly Principal of King's College, in proposing a vote of thanks for the Paper, said he felt grateful for having been given the opportunity of speaking about the building of King's College Hospital, for, as a member of the Building Committee, he had been connected with it from the beginning; and there were a few points which, from a lay point of view, it might be well to emphasise. The occasion also gave him the opportunity to express his thanks not only to Mr. Pite for the extraordinarily able manner in which he had carried out his designs, but also to some others who had worked upon the Hospital. First of all he would express their obligations to Mr. Rowland Plumbe, who was well known as a hospital expert, and had worked for years at the London Hospital. He was appointed by the President of the Institute as Assessor in the competition, and had thrown himself into the work with the greatest ardour, bringing into their specifications and terms of competition all the experience he had gained from the London Hospital. That was a very great point in their favour at the start. As far as he (Dr. Headlam) could judge—and he had inquired into it very carefully—the Committee had every reason for

believing that their Hospital was not only well constructed and designed, but also that it worked admirably. He had taken the trouble to interview the heads of departments, and had talked with a large number of those who worked in it; and they all, without exception, expressed entire satisfaction with the way in which the designs had worked out. He was informed by the Secretary that he had taken round the Hospital an American expert in hospital construction. We did not, as a rule, expect very great praise from Americans for the somewhat feeble efforts—as they thought—of this country, but he was pleased to say that this American expert stated as the result of his visit that he had found fifty per cent. more foresight in this Hospital than in any other that he had seen. There were two or three ways in which this result had been gained. He had mentioned the help which Mr. Rowland Plumbe had given them at the beginning. Then they had formed a Committee; and there were one or two points with regard to that Committee which he would dwell upon. There had to be a majority of lay members, whose business it was ultimately to decide on debated points. Then there were experts in all the departments, experts in sanitary science, and representatives of the different departments of the Hospital. They had had in particular the help of the lady who at that time was Sister-Matron at the Hospital, Miss Catherine Monk. She died only a few weeks ago. Miss Monk was one of the ablest of the many able women who had presided over the London hospitals, and a very large amount of the practical convenience of the plan was due to her suggestion and initiative. They took the greatest care that all the departments worked in the Hospital should be carefully consulted upon every detail. It might seem extraordinary that it should be necessary to emphasise that, but only the other day he was going over a very important public building—he would not mention the name—which had been erected not long ago in London by the Office of Works, and he was informed that not one of the departments had been consulted in any way about the planning or arrangement of that building. The result was that, although it was a fine and imposing structure outside, when they came to work in it the building was found to be full of defects, and many of the most important points had been forgotten. Therefore, speaking to architects, he would like to emphasise the importance of every department being consulted. The arrangement for consulting the different departments of King's College Hospital was this: The Medical Staff appointed a Watching Committee, consisting of those members of the staff who took the greatest interest in the building and would give up most time to it. And that Watching Committee had two representatives on the Building Committee. Every single department sent in its requisitions; these were gone through by the Medical Committee, and then they came before the Building Committee. The result was that no department was allowed to develop its work or its demands at the expense of any other. The Building Committee, and of course the Architect, had the considered opinion of the Medical Staff on every material point. A member of the staff who had helped them immensely on the Watching Committee was Dr. Silk, its Secretary, who had devoted a large amount of time and trouble and care in keeping the work together. In order that good results might be obtained, two things were necessary. One was that the Medical Staff should be reasonable in their demands, and he was bound to say that, throughout, the Medical Staff of King's College Hospital took the greatest care not to demand anything which was unreasonable or extravagant, and they were always ready to help the Building Committee in every way. On the other hand, it demanded sometimes a good deal of patience on the part of the Architect to meet their demands. Again and again he had admired the patience, courtesy, and skill with which Mr. Pite devoted himself to meeting the special demands of each department; he was prepared to change his plans again and again, and often to sacrifice architectural points which he cared for a good deal. All these preliminaries took considerable time, and it was, he believed, four years before the building was begun after the first plans were constructed. And he thought the hearty co-operation of the Medical Staff, the different departments, the Sister-Matron and the Architect, had had the effect of producing a very remarkable building. Personally he had been a bit of an amateur architect all his life; and the opinion he had formed of Mr. Pite's work had been this: that in all cases the artistic work had come out of the needs of the building in the structural work. In no case had there been ornament put in merely for the sake of the ornament. But, somehow or other, by making the Hospital fulfil its purposes as well as possible, the Architect had succeeded in producing what was in all respects a very pleasing building. The façade and the interior of the Chapel were most attractive, and in no part of the work was there anything which was not in perfect harmony with the purpose of the work—well proportioned and well constructed. It was with very great pleasure that he proposed a vote of thanks to Mr. Pite for his Paper, and he would express his own thanks and the thanks of all connected with the Hospital for the enormous trouble, patience, and skill which Mr. Pite had shown in designing and carrying out the building.

The Hon. R. C. PARSONS, M.A., M.Inst.C.E., Member of King's College Council, in seconding the vote, said that Dr. Headlam and himself had been colleagues in connection with the hospital from the first, and he fully endorsed all that Dr. Headlam had said. It was now thirteen years since it was decided to move King's College Hospital from its original site to the south side of London, and it was a question as to what site should be selected. There were a number of positions proposed; some on the flat ground between Denmark Hill and the river, and others

on higher ground; and the eminent physician Dr. Buzzard was deputed, with himself, to visit the several sites selected out of the large number proposed. Amongst others they visited the Denmark Hill site. They realised quite clearly that that site was facing the north, but all the same the back of it faced south and also faced a beautiful park. Hence, although the front faced the north the sun would shine on the back, and if the architect designed his buildings with that fact in view, all the advantages of the sun could be obtained, as well as the beautiful view over Ruskin Park. The area was twelve acres. He and his colleague agreed that this was the most desirable site, but—could they afford it? They made their representations to the committee, and as soon as the report was presented Mr. W. F. D. Smith (now Lord Hambleden) came forward in the most magnanimous way and offered the sum necessary to purchase that site, in memory of his late father. The next question was to select an architect who would prepare designs to make the best use of the site. A large number of eminent architects were asked to submit plans. Mr. Pite, with his usual modesty, had passed over that question with very little comment; but he might say that they looked through all the designs, and with the aid of Mr. Rowland Plumbe, the eminent architect, came to the conclusion that in selecting Mr. Pite's design they were doing well. The designs were prepared, and many and many days were spent in considering the various details. Every question was thrashed out, and, from first to last, in a most harmonious manner. The result had been put before the meeting that evening by Mr. Pite, and he wished that a doctor were in his place now, for he would be better able to appreciate the various details which had been described. From an engineer's point of view, he considered that the design had been worked out most skilfully. The use of reinforced concrete, the application of which he had studied a good deal, had been exceedingly well introduced; it lightened and improved the design of the building very considerably, especially from the sanitary standpoint. The next question was that of heating and lighting. They had as next door neighbour a large electrical company, and the Committee discussed very carefully whether they should take their current from that company. In the end it was decided to be independent and have their own installation. The question of a well also was considered, and they came to the conclusion that, at all events for the time being, it was advisable to take their water supply from the London services. Later on it might be advisable to sink a well, though in that case the water was sure to be very hard, coming, as it would, from the chalk, and a softening apparatus, which was always difficult to work, would have to be introduced. Then there was the all-important question of maintenance. This had to be kept carefully in view, in order that the working expenses might be kept down to a minimum. He did not believe any heat was being lost; but, on the other hand, all was used to the best advantage. From that point of view, therefore, the working expenses were kept down to the very lowest. There were many other points which but for the lateness of the hour he could touch upon. He would only say in conclusion that he thought the whole building reflected the greatest possible credit upon Mr. Pite.

DR. SILK said that as he happened to be the only member of the Medical Staff present, he would accept this opportunity of expressing, on behalf of the Medical Staff, their appreciation and gratitude for the very excellent building which Mr. Pite had put up for them. Allusion had been made to the fact that the Medical Staff had been consulted freely before the plans were decided upon, and he thought it was owing to this that no friction whatever had arisen between them and the Architect. The Watching Sub-Committee of the Medical Staff was appointed to go very carefully into all matters connected with the foundation of the Hospital and the buildings, and took a great deal of trouble. They visited hospitals all over London and in the Provinces to see what they could pick up in the way of "tips" on various details; and he felt sure that, for many years to come, King's College Hospital as designed by Mr. Pite would be a classic example of hospital construction, so that any other architect who undertook to build a hospital would have first to consider very carefully the design and arrangement of King's College Hospital. Whether or not he adopted them in their entirety was another matter. But he felt sure Mr. Pite had constructed a hospital which would be a great example of hospital construction for the future.

MR. E. L. LEVETT, K.C., member of the Building Committee, said he was only a new-comer at the Hospital, but he had to do work in it now, and that work was made very much easier by the admirable way in which it was arranged throughout.

CAPTAIN A. C. TUNNARD, Secretary of the Hospital, expressed his appreciation of the Paper and his concurrence with what had been said by the members of the Hospital Committee who had addressed the meeting that evening.

MR. H. W. WILLS [*F.*] said he had great pleasure in supporting the vote of thanks to Mr. Pite. They were accustomed to hearing most hospitals described as containing the latest improvements; and although he could bear testimony to the admirable way in which the King's College Hospital was planned, he would refer to a point which had not been alluded to by previous speakers. They usually went down to a hospital to admire its plan and the manner in which it fulfilled certain practical wants; but, unfortunately, as a rule they could not look upon it as a building which carried on the historic traditions of English architecture. But he thought that King's College Hospital aroused in them something of the feeling with which such a great work as Chelsea Hospital inspired them. That, too, was a building which was exceedingly simple and direct in its expression, having occasional architectural features which gave

emphasis to the brick-work. And he thought Mr. Pite had carried out the same feeling in King's College Hospital, and so it would show future generations that we in this generation had learned something from Sir Christopher Wren. He was perfectly certain that King's College Hospital would not only be considered in the future as a good type of hospital design, but as a most excellent example of English architecture, which would give pleasure to a great many architects, which more elaborate and decorative buildings often failed to do.

MR. S. PERKINS PICK [*F.*] said he could not add anything useful to what had been said already, except to offer his very hearty congratulations to Mr. Pite on the successful termination of this huge work. The various details one could occupy many hours in discussing. He thought Mr. Pite had given a lead to the whole profession in the admirable manner in which he had tackled this very difficult problem. The only detail he felt inclined to mention was that he thought, as days went by, they would find that the open balconies provided were hardly sufficient for the hospital. There had been a great evolution in the utilisation of open balconies during the past ten years. This hospital was probably designed before the full effect of that came into force: but in years to come he thought open balconies would become more and more general, because he believed it was generally admitted that surgical wounds and other cases get well in a much shorter space of time by getting the patient in the open air than when they were in wards, no matter how well such wards may be ventilated.

MR. WILLIAM A. PITE, in reply, said he had felt exceedingly diffident about coming to that meeting to talk about his own work. He was, however, most grateful to Dr. Headlam and Mr. Parsons for the generous way in which they had spoken. One of the joys of carrying out the work had been the reconciling of the varying views of the Medical and Surgical Staff, and the close contact in which the work had brought him with the Watching Committee. Dr. Silk could have told them that the Committee had held about fifty-six meetings, mainly after 8.30 at night, and often continuing to close on midnight. He would not like this occasion to pass without expressing his warm appreciation of the extreme sympathy and help that Lord Hambleden had rendered from the commencement. When he (Mr. Pite) first entered upon this great work he wondered whether he should ever see it built. But the sympathy and help he received at all times, not only from Lord Hambleden but from every member of the Medical Staff, had been most encouraging. It was impossible for one human being to carry out unaided so great a work, and he owed a deep debt of gratitude to the staff who had served him during its progress. It had been a very happy time; the whole thing had been carried through without friction or trouble of any kind. Added to that, to have a firm like Messrs. Foster and Dicksee to erect the building, and such a capable foreman and clerk of works as Mr. Simpson, had lightened his work enormously. He thanked the Meeting most heartily for the patience with which they had listened to him and for their kind expression of thanks.

Central Corridor, Administrative Block.

REVIEWS.

RURAL BUILDING BY-LAWS.

Building By-laws in Rural Districts. By Sir William Chance, Bt., M.A., late Chairman of Committee, Building By-laws Reform Association. London: P. S. King & Son, 1914.

Sooner or later every architect is aggrieved by the operation of some by-law or other in a rigid code, and longs for greater freedom. Like the Building By-laws Reform Association, he may feel that "any effort to get rid of Building By-laws altogether would be time and money thrown away," but he, like them, tries to find out how such by-laws may "be made more elastic in their operations." It is only when he gets to close grips with the subject that he discovers how complicated and difficult it really is, and how easily in evading one pitfall he may tumble into another. The subject is really one which calls for the co-operation of the architect, the surveyor, and the trained lawyer well versed in building law.

Sir William Chance's book is a bold attempt to provide a new code of building by-laws for rural districts. The code, we are told in the preface, was "drafted by an experienced and well-known architect," but no doubt the compiler of it would be the first to admit that a lawyer's collaboration would be necessary to bring the code into proper form. In the first place attention may be drawn to a striking difference in the drafting. The L.G.B. By-laws are personal: Every person who shall erect a new building, or construct an earth-closet, &c., shall carry out the works in certain specified ways. In the new code most of the by-laws are impersonal: for example, "The whole ground surface or site of a new dwelling-house . . . shall be properly asphalted or covered with a layer of good cement concrete." No great difficulty of interpretation arises from this change of drafting until we come to by-law 11. By-laws 1 and 2, I may say, deal with definitions and exemptions, and in by-laws 3 to 10 inclusive the word *new* is always inserted in connection with the building to which the several by-laws apply, but by-law 11 provides that "no pipe used for the purpose of conveying rain-water from a building shall be in direct communication with any drain used for conveying sewage," and by-law 13 requires that "sanitary accommodation must be provided in or adjacent to *every domestic building*." By-laws 21 to 25 contain provisions applicable to "every water-closet"; by-law 27 applies to "every earth-closet in or in connection with any dwelling-house or in any building in which any person may be . . . employed"; many of the by-laws 28 to 38 apply to "every privy" or to "every ashpit"; and by-laws 39 to 42 apply to "every cesspool in connection with a building." The alteration of the method of drafting and the omission of the word *new* in the by-laws referred to appear to warrant the conclusion that these by-laws would apply to old buildings, as well as to new. If this is the intention, the reader's attention ought at the least to have been drawn quite clearly to the change. If it is not the intention, then the redrafting is unfortunate.

One or two changes in other by-laws are somewhat curious. The Model By-law requires an asphalt or concrete layer over the site of all new "domestic buildings," and by definition "domestic buildings" include dwelling-houses, outbuildings, shops, &c.; but the suggested by-law 3 requires the ground-layer under new dwelling-houses only. Surely shops ought not to be excluded. Again, the suggested by-law 27 requires a window to be provided in "every earth-closet *in* or *in connection with* any dwelling-house," but in the case of a building in which any person may be employed in any manufacture, a window is required in the earth-closet if, and only if, this is "*in*" the building, the words "or in connection with" being in this case omitted. It is difficult to find a reason for this difference. If a window is necessary in an earth-closet in connection with a dwelling-house, surely it is necessary in one in connection with a workshop. Again, a w.c. must have a window of certain *minimum* dimensions, "opening directly into the external air"; an earth-closet must have "a window [no dimensions specified] communicating directly with the external air." Why are dimensions given in the one case and not in the other, and why is one window described as opening and the other as communicating?

Perhaps the most radical difference between the proposed Code and the Model Rural Code is in the by-laws dealing with air-space about buildings. The new by-law 6 provides that a new domestic building, with exceptions to be noted later, "shall have in connection therewith an open space exclusively belonging thereto, equal in area at the least to the area of the building . . . and the building therein shall be so placed that two sides at least shall open for purposes of light and ventilation on such open space, or on a street, road, or other public open space immediately adjoining such building." In a note we are told that under this by-law "the position of the building in the space is left to be arranged by the builder." Frankly, I think this goes too far: it might result in a quite inadequate space being left on one side of a building. But a nice legal question is also raised: What would be the effect of the by-law in the case of any house, not an end house, in a group of three or more houses? In such a case there is, as a rule, an open space in front and another open space in the rear, and the intention of the new by-law, if one may judge from the "Note," appears to be that these two open spaces taken together shall be equal in area at the least to the area of the building, but the by-law itself refers to "an open space" and to "such open space"—in other words, to one open space and not to two—and it might with good reason be held that either the front open space or the rear open space must have the area specified. But this is not all: the by-law lays down that "the building therein shall be so placed that two sides, at least, shall open . . . on such open space, or on a street, road, or other public open space imme-

diately adjoining such building." This appears to preclude any *private* open space on one of the two exposed sides of a house in the middle of a row. If the open space required by the by-law is provided in the rear of a house, there cannot be a front garden, as the front of the house must "open . . . on a street, road, or other *public* open space *immediately adjoining such building*." A similar difficulty confronts us if the open space required by the by-law is provided in front of the house, as the back of the house must then open on a street, road, or other public open space immediately adjoining such building. Surely this is not intended. Or is the by-law a subtle way of ordaining that nothing but detached or semi-detached houses must be built in rural districts? In these cases the open space for each house could be one open space, partly in the rear, partly at one or both ends, and partly also in front if desired, and the intention of the by-law, as explained in the "Note," could be carried out.

I have already said that there are exceptions to the operation of this by-law. It is proposed to exempt any domestic building "not occupying a greater area nor having larger cubical contents than an existing domestic building on the same site." Quite apart from the objection to such an exemption on sanitary grounds, the exemption is, I think, bad in law. What constitutes a new building is defined in the Public Health Act of 1875, and in effect this suggested by-law attempts to substitute a new definition. A statutory provision cannot, however, be altered by a by-law, and the exemption would, I think, be held to be *ultra vires*. Other details to which reasonable objection might be raised could be mentioned, but enough has been said.

In addition to the suggested code, the book contains the text of a short bill of five clauses, entitled The Public Health Acts (Building By-laws) Bill. This Bill passed the House of Lords in 1906, but was not passed by the Commons. It sought to exempt certain buildings in rural (and also, with the consent of the Local Government Board, in urban) districts from the operation of by-laws with respect to the structure of walls, &c., and to provide a simple mode of procedure for a person aggrieved by any by-law. The aggrieved person was to have the right of applying to a Court of Summary Jurisdiction, with a right of appeal to a Court of Quarter Sessions. That some kind of procedure is necessary to prevent the operation of unduly onerous and obsolete by-laws probably all architects are agreed, and many think that the suggested mode is as good as any.

The book is an interesting sign of the times. When a public man like Sir William Chance takes the trouble of preparing a book on such a dry and technical subject as by-laws, it is evidence of public interest in the question. There is no doubt whatever that the Local Government Board is anxious to remove all reasonable grounds of complaint against the by-law system, but at present the Board has not the power to compel a Local Authority to adopt new by-laws or to alter existing ones.

G. L. SUTCLIFFE [*F.*]

MONT SAINT-MICHEL AND CHARTRES.

Mont Saint-Michel and Chartres. By Henry Adams. With an introduction by Ralph Adams Cram. Sm. 4o. Boston and New York, 1913. 25*s. net.* [*Houghton Mifflin Company, Riverside Press, Cambridge, U.S.A.*]

The author treats his subject thoughtfully and with originality, and writes in a readable style. The plan of his book represents him as mentor of an American party engaged in a "tramp abroad." Therefore the book does not pretend to be a work of reference, and should not be criticised as such. Viollet-le-Duc is much quoted in the architectural chapters, but next time the author visits Chartres he will do well to spend a couple of francs on M. René Merlet's Guide to the Cathedral, which may cause him to modify his views as to the plan of the chevet; at present he follows Viollet-le-Duc in regarding this plan as an arbitrary and somewhat clumsy conception of a thirteenth-century architect, and fails to tell his readers that its peculiarities are really due to that architect's ingenuity in making the utmost possible use of the foundations and crypt of the earlier church. These foundations are laid out on the conventional French Romanesque lines, an apse with procession path and three deep radiating chapels opening therefrom, the chapels isolated and not clustered. All the thirteenth-century architect added in the way of foundations was a series of curtain walls between the apses of these isolated chapels, and this gave him the present plan of the chevet, which Viollet-le-Duc says does him little credit, and which Mr. Adams explains in a rather fanciful manner.

The author writes with discernment about the somewhat similar economic reasons which have given us the west front of Chartres in its present form. His chapters on the twelfth- and thirteenth-century glass in the cathedral are excellent; they are no mere catalogue of subjects, and they help the reader to recall a vision of this special glory of Chartres. So much, indeed, does Mr. Adams admire these early windows that he has apparently been unable to enjoy the fourteenth-century glass at St. Pierre, the big church in the lower part of the city—and he has lost much innocent pleasure thereby.

Some of the earlier chapters and the whole of the end of the book are devoted to transcendental theories of literature and general history: in these matters the every-day architect must fain sit at the author's feet. The Institute JOURNAL is hardly the place in which to review these "ex cathedra" pronouncements, but it is a very suitable publication in which to acclaim a kindred spirit in one who writes with such grace and freshness of his love for Chartres.

CHARLES A. NICHOLSON [*F.*].

Books Received.

Lithography and Lithographers. By Joseph Pennell and E. Robinson Pennell. (The Graphic Arts Series.) 4o. Lond. 1915. 10*s.* 6*d.* net. [T. Fisher Unwin, 1 Adelphi Terrace, W.C.]

Individuality. By Charles Francis Annesley Voysey. 8o. Lond. 1915. 3*s.* 6*d.* net. [Chapman & Hall.]

9 CONDUIT STREET, LONDON, W., *24th April* 1915.

CHRONICLE.

R.I.B.A. Record of Honour: Ninth List.*

Killed in Action.

WHITEHEAD, HENRY MONTAGU [*Student R.I.B.A.*]: 2nd Lieut. 4th Bn. East Surrey Regiment—killed in action on the 14th April.

Mr. Whitehead, who was twenty-four years of age, was the second son of Mr. Henry H. Whitehead, of Boston Road, Brentford. Having passed through the four-years' course of the A.A. School of Architecture he was exempted from the Intermediate Examination and was admitted Student R.I.B.A. in December 1913. He was a pupil and afterwards assistant with Mr. W. A. Forsyth [*F.*], and was subsequently in the office of Mr. W. H. Harrison [*F.*].

On War Service.

Below is published the Ninth List of Fellows, Associates, Hon. Associates, Licentiates, and Students of the Institute who have joined the Military and Naval Forces of the Empire for the period of the War. The total numbers to date are 37 Fellows, 242 Associates, 100 Licentiates, 1 Hon. Associate, and 133 Students.

HON. ASSOCIATE.

Crawford and Balcarres, Rt. Hon. the Earl of: Pte., R.A.M.C.

FELLOWS.

Barnard, L. W.: Captain, 16th King's Royal Rifles.
Scorer, G. O.: Inspector of Works, Staff for R.E. Services.
Williamson, William: Lieut., 7th Bn. Black Watch.

ASSOCIATES.

Adams, P. Tidswell: 2nd Lieut., Duke of Wellington's Regt.
Aylwin, G. M.: Surrey Yeomanry.
Berrill, Ralph: 2nd King Edward's Horse.
Foster, Frank: R.E.
Hobson, J. Reginald: O.T.C.
Hughes, Basil: Lieut., R.E.
Kay, G. A.:
Lyon, Maurice: R.N.A.S.
Mulready, Paul: 2nd Lieut., 9th Bn. Loyal North Lancs.
Nott, George: O.T.C.
Payne, Edwin O.: Durban Light Infantry.
Roberts, R. M.: Major, A.S.C.
Sagar, W. H.: R.E.
Sutcliffe, Eric J.: R.A.M.C.
Woodward, Frank: R.A.M.C.

LICENTIATES.

Birks, Ellis R.: 2nd Lieut., 2/1 W.Y., R.F.A. (T.).
Crawford, Charles: Staff, T.F. Records Office.
Hayward, A. B.: Royal Fusiliers.
Horth, Frederick J.: Artists' Rifles.
Sanderson, L.N.: Sub-Lieut., R.N.V.R.
Stewart, Hugh: 6th Field Co., Canadian Engineers.

STUDENTS.

Brown, C. W.: R.E.
Farey, C. A.: 2nd Lieut., A.S.C.
Francis, G. E.: R.E.
Lloyd, Albert P.: 2nd Lieut., Welsh Regt.
Meredith, Edward: 15th R.W.F. (London Welsh).
Peel, Arthur: R.E.

Major A. B. Hubback [*F.*], of the Public Works Department, Kuala Lumpur, and late of the 19th Bn. London Regt., has been promoted Lieut.-Colonel Commanding the 20th Bn. London Regt., with the British Expeditionary Force.

Mr. W. Hubert Godwin [*A.*], formerly a private in the 3rd Bn. Royal Warwick Regiment, has obtained a commission as 2nd Lieut. in the 4th Bn. of the same regiment.

Mr. G. Howard Jones [*A.*], formerly of the Public Schools Bn., Royal Fusiliers, has obtained a commission as 2nd Lieut. in the 3rd Bn. Welsh Regiment.

* Previous Lists will be found in the JOURNAL for 26 Sept., 17 Oct., 7 Nov., 21 Nov., 9 Jan., 23 Jan., 6 March, and 3 April.

Factory Buildings.

Mr. Segar Owen's valuable Paper, "The Design and Construction of Buildings for Industrial Purposes," read at the Institute last Monday, will be published in the next issue of the JOURNAL, together with a report of the interesting discussion which followed, and communications since received on the subject. The President, Mr. Ernest Newton, A.R.A., now fairly recovered from his recent indisposition, presided at the meeting, and joined in the discussion. Other speakers were Sir William Lever, Bart. [*Hon. A.*], who was a guest of the Council at dinner that evening, Mr. Matt. Garbutt [*F.*], Mr. William Dunn [*F.*], and Mr. Max Clarke [*F.*]. An outstanding point in Sir William Lever's remarks was the advice to cheapen the cost of factory buildings. Factories, he said, are built much more solidly than is necessary, and a factory built too solidly is not an economical building. A mere change in the process of manufacture, a change in the type of machinery, may involve the scrapping of the factory and the erection of an entirely new one. The only type of factory which commended itself to him was one on the "concertina plan." Only the outside boundary walls need be permanent; the whole of the inside partitions might be but half a brick in thickness; they should be of such a character that they could be easily torn down when departments were required to be enlarged.

Official Architecture Committee.

The Council have received a report from the Official Architecture Committee, which was appointed in the year 1912, to consider and report upon the whole subject of Official Architecture. In the opinion of the Council the Report is of such a controversial nature that the present is not a suitable time for its discussion, and the Council have accordingly decided to defer its consideration for six months. Members will recollect that a similar decision has been arrived at in connection with other controversial matters which are being dealt with by the Council.

Town Planning.

At the Westminster Palace Hotel on the 20th April there was a conference of local authorities representing Greater London, Middlesex, Hertfordshire, Kent, and Surrey, arranged by the National Housing and Town Planning Council to consider the detailed preparation of town-planning schemes and the administration of the new Housing Act during the period of the War.

The first matter considered was the number of houses that should be allowed to the acre. The Chairman, Mr. F. M. Elgood [*F.*], favoured a limitation of twelve to the acre, either for workmen's dwellings or other buildings. Many speakers contended that it was inadvisable to fix a maximum. The price of the land was a considerable factor, and it was mentioned that at Tottenham, when the local council wished to erect a public convenience, the owner demanded £32,000 an acre for the land.

Mr. Birkett, of the Hampstead Garden Suburb, said one could get as much land as was required for building round London at from £250 to £300 per acre, but there was a great difference in the price of land in the north of England. By limiting the number of houses to the acre they would find that the cost of land in the north would go down very much, although not so low as in the London area, and so remove one of the greatest difficulties in the housing question.

The Chairman announced that under the Ruislip scheme the Council had been successful in acquiring 106 acres for open spaces without the necessity of paying a farthing of compensation.

The Local Government Board have given authority for the preparation of nine further town-planning schemes, covering about 19,611 acres. The places are Newport (Mon.), Southend-on-Sea, Wallasey, York, Beckenham, Hendon, Heston and Isleworth, Ruislip-Northwood, and Honiton.

Risk of House Famine After the War.

At the National Housing and Town Planning Council Conference at the Westminster Palace Hotel, on the 21st April, fears were expressed that at the close of the War all the worst features of a house famine would exist. In a memorandum on the building of cottages Mr. Henry R. Aldridge, secretary of the Council, pointed out that after the war private capital might be attracted by high rates of interest into fields of investment other than those of cottage building, with the result that there would not only be a shortage in the supply of new houses, but house-owners would be in a position to demand and obtain rents out of proportion to the original cost of construction. He suggested that, in addition to stimulating and aiding the work of local authorities in the erection of houses, the State should give facilities to public utility societies and to private enterprise, under well-defined conditions, to provide houses in all areas where there was a recognised deficiency of supply.

The Roof of Westminster Hall.

In the House of Commons on the 15th April, on the vote to complete the sum of £74,000 for the Houses of Parliament buildings, Mr. King drew attention to the work which has been begun upon the roof of Westminster Hall.

There were, he said, a great number of points in connection with the way the work had been decided upon and undertaken which were open to the strongest suspicion. Any proposal to deal drastically with this great historic building ought to have been put before the House and the public with much greater fullness and opportunity for discussion and modification than had been given by the Office of Works. Not only was no public investigation held, but expert opinion on Gothic architecture was ignored. Why was no architect who had been engaged on repairing the roof of the great Cathedrals, Canterbury, York, Westminster, and Durham, consulted? It seemed as if the Office of Works formed a preference for an iron and steel roof, and decided to carry it out at all cost. He thought that if there was a reversion to the ancient lead roof of the Hall in substitution for the slates the strain on the timber would be considerably lessened. He doubted whether it had ever occurred to the Department, or whether they had ever considered the beauty of the ancient building from the point of view of restoring it and keeping it as nearly as possible in its old condition. He submitted that there was a very grave case of vandalism against the Office of Works. From below, the roof might look the same, but it would no longer be an existing piece of Gothic art. The real antiquarian character of the roof would be gone for ever.

Mr. Soames held that the Office of Works had proceeded on perfectly sound lines. They were going to put a very slight steel bracing behind the old timbers, so that almost every cubic inch of the present timbers as they had existed for many years would be preserved to us and to our children practically in appearance as they were to-day. It was true that when the scheme prepared by the Office of Works, and described in the very admirable report of Mr. Baines, was made public, one letter from an architect appeared in *The Times*. The writer of that letter found fault with the scheme, and suggested the rebuilding of the whole roof. He (Mr. Soames) read that letter with amazement. He was astounded that any man with any architectural pretensions should propose to destroy and reconstruct this roof, when it was possible to keep the old roof in existence by simply bracing it together with steel. Not very long after there appeared another letter in *The Times* in support of the action from two of the most eminent architects of the present day—Mr. Reginald Blomfield and Sir Aston Webb. Both those eminent architects expressed entire approval of the scheme. The suggestion was thrown out that the Office of Works had a preference for an iron and steel roof, and having that preference, set to work to devise a scheme to carry it out. Mr. Baines's report, however, showed that the matter had been gone into with exceeding carefulness. The hon. member said that if the existing roof was preserved in its entirety, simply braced together with a slight steel structure, that the whole of the antiquarian character would be gone. What he wanted to do was to take away a great part of it and put up a new building; then apparently, in his view, the antiquarian character would have been saved! That was a reasoning he (Mr. Soames) could not understand. If the hon. member had the anxiety to preserve the antiquarian character of the old building he would most certainly, instead of asking for the destruction of a great part of it, approve the scheme of the Office of Works, which would preserve the whole of what we have now for years to come.

Mr. Beck, replying for the Office of Works, said it was quite a mistake to suggest that there was anything either hurried or surreptitious about the treatment of Westminster Hall roof. After the unusual step had been taken of conducting members round the roof the House deliberately voted £10,000 for starting the work now in hand. Before Mr. Baines's able report was

adopted it was submitted to the Ancient Monuments Committee, one of the most eminent bodies in the country, and carefully considered by them, and afterwards submitted by them to Sir Aston Webb and Mr. Reginald Blomfield, who agreed that the report was a most valuable one, and would preserve this great monument in the most admirable manner. "It is, indeed, a very strange idea," he continued, "to suggest that, instead of preserving these old timbers, the actual timbers which our ancestors put into the roof, which they felled and so magnificently designed, we should put in their place other timbers like them and destroy the old beams that are there. My hon. friend is very much mistaken when he talks about the timber being a magnificent work of carpentry until Mr. Baines's scheme was adopted. As a matter of fact when Barry restored the roof he used very much the same methods to a certain extent as are used now—that is to say, he used iron and steel in order to strengthen the roof, in just the same way as it is proposed to do now. As regards the lead roof, that is a mere matter of expense. At any rate, even if the criticisms are right—and I do not say they are wrong—it is now too late, because Parliament has voted the money, the orders have been given and the whole thing is well on its way."

The vote was agreed to.

Experiments in the Ventilation of Schools.

In the House of Commons last Tuesday, Mr. King asked the President of the Board of Education whether he was aware that the architect to the Board took part in experiments, made at Birkenhead on 20th November 1913, into the ventilation of schools; whether any report was made to the Board on these ventilation tests; and, if so, whether the Report had been or would be made public.

Dr. Addison: The answer to the first part of the question is in the affirmative. The Board's architect did not in this case submit any formal report, but even if he had it is not my practice to publish the advice given by my officers on matters affecting the administration of the Board or other Departments.

Mr. King: Is the hon. gentleman aware that there is a great deal of uncertainty in the policy of the Board with regard to ventilation enquiries, and consequent difficulty arising in formulating plans by the Local Education Authorities?

Dr. Addison: The schools are provided by the Local Authorities.

The Front of No. 9 Conduit Street.

A few years ago the proprietors of *The Builder* instituted a competition offering valuable prizes for the two best designs for a suggested new façade to the Institute premises, No. 9 Conduit Street. Regret was expressed that "the central home of the architectural profession should not be represented by something of more architectural importance and significance than the existing rather prim piece of cement classicism," and the younger members of the profession were invited "to suggest what they could do by way of replacing the present façade with something of more monumental character." Nevertheless, in the opinion of many, the present quiet, unobtrusive front has its merits, not the least being a certain quality of repose which distinguishes good architecture and which is often deplorably absent in more pretentious buildings. One of the latest admirers of the old front is "Ubique," of the *Architects' and Builders' Journal*. Writing in last week's issue, he says:—

"Looking at the front of the Institute premises in Conduit Street the other day I wondered what was so wrong with it that some desired to replace it with a modern front, and I soon came to the conclusion that there was very little wrong with it, that it was, in fact, a delightful façade, marred only by the absence of the window bars which disappeared when plate-glass came upon the scene. The Institute should be very jealous of their front, and should warn off the spoiler itching to do something better. There is a scholarly air about this façade which is very proper to the headquarters of the architectural profession in this country. It belongs to a period when classical architecture was better handled than it is to-day, and its obvious merit should assure its preservation. But the Institute might well depute its most skilful member in these matters to put back the window bars; to fill in the fanlight over the entrance, which looks rather bare as it is at present; and to replace the railings with others more worthy of the fine façade behind them.

It is fair to mention that the response to *The Builder* competition above referred to was a very good one. Some excellent designs were submitted, and the first prize was awarded to Mr. Stanley J. Wearing [*A.*] for an exceedingly careful and refined piece of Classic design. It is illustrated along with the second-prize design in *The Builder* for the 8th January 1910.

Fire-Resisting Glazing.

Two Reports have been issued by the British Fire Prevention Committee on recent investigations undertaken by them with wired glass as applied to window openings and to skylights. These tests are a continuation of a series of tests with wired glazing which they undertook some ten years back at the instance of Messrs. Pilkington, of St. Helens, and the series of some seven Reports spread over the last decade shows the remarkable manner in which the fire resistance of glazing of this type has been successfully developed.

The two Reports now presented afford remarkable evidence of the fact that wired glazing, when vertically used in windows, has withstood the heavy strain of the British Fire Prevention Committee's tests for a period of 90 minutes at temperatures gradually increasing to 1,500° F., the fire tests being immediately followed by the application of water from a steam fire engine applied at close range. Further, when horizontally used, this glazing has withstood the fire test of an hour's duration at similar temperatures, followed by a similar application of water. The maximum size of any piece of glazing under test in a vertical position was 4 feet by 1 foot, and the maximum temperature attained in the skylight test was 1,600° F.

Both tests are records for wired glazing, and claim considerable attention, as they put modern wired glazing, when suitably fixed, in the same fire-resistive rank as fire-resisting partitions and doors of considerably greater thickness and weight.

The Campden Summer School.

The attention of architectural pupils and students is drawn to the course in Architectural and Landscape Drawing provided at the Summer School in connection

with the Campden School of Arts and Crafts to be held from the 9th August to the 3rd September. The General Director is Mr. C. R. Ashbee [*F.*], and the Instructor Mr. F. L. Griggs, who has in many drawings recorded the charm of the Cotswold villages. The classes will be chiefly for the study of technique and composition. They will be held twice a week in August, and students will be at liberty to choose their own subjects, working either together or individually, and will have the opportunity of meeting the Instructor one evening a week for his criticism of their work done apart from the classes. There is also a course in Wood and Stone Carving, with Modelling and Figure Structure. Full particulars may be had from the Secretary, Mr. W. T. Hart, Campden, Glos.

OBITUARY.

The late Samuel Flint Clarkson [*Retired Fellow*].

Mr. S. Flint Clarkson, who died on the 4th April, at the age of seventy-five, became an Associate of the Institute in 1869, proceeded to the Fellowship in 1885, and was placed on the list of Retired Fellows in 1910. Until a few years ago he took a prominent part in the activities of the Institute, serving for several years on the Board of Examiners and as a member of the Practice Standing Committee. He had been a member of the Architectural Association since 1860, and acted as Hon. Secretary in the years 1872 to 1876, and as President in 1879–80. To the JOURNAL of 7th November 1908 he contributed an appreciation of his master, Mr. John Gibson, whose work considerably influenced him throughout his career.

S. Flint Clarkson was articled in 1854 to Mr. Charles Ainslie, architect and surveyor, of Old Jewry Chambers, E.C., and on the completion of his articles remained with him as assistant until June 1862. During the year 1861 he attended Professor Donaldson's lectures at University College. In 1862–63 he was assistant in the office of Mr. F. W. Porter, of 16 Russell Square; and from 1863–67 managing assistant to Mr. John Gibson, of 13 Great Queen Street, Westminster. In 1867 he started practice with his brother, Mr. John Clarkson [*F.*], at 36 (now 28) Great Ormond Street and St. Albans, Herts. Among works carried out by the firm were the Club and Mission Hall, and also the Boys' School, of St. George the Martyr, Queen Square; various manufacturing premises in Kirby Street, Charles Street, and Great Saffron Hill, Hatton Garden; shops and warehouse premises in the Strand; schools for the St. Albans School Board; Westminster Lodge and other residential buildings at St. Albans, including roads and many houses on the St. Peter's Park Estate; Hill Court, near Edenbridge, Kent, &c. Messrs. J. & S. Flint Clarkson were also the architects of the Mission Hall of St. Frideswide, Poplar, for Miss Catherine Mary Phillimore (Clewer Sisters of Mercy, Oxford), and the church of St. Nicholas, Blackwall; the Public Library, Poplar; alterations, &c., Poplar and Stepney Asylum, and All Saints' Church, Poplar; the new Baths in Glengall Road, for the Poplar Vestry; Public Library, Commercial Road, Limehouse; conversion of Brunswick Hotel, Blackwall, for the purposes of the Poplar and Stepney Sick Asylum; alterations and additions to the Town Hall, Poplar; the new Swimming Baths in Broad Street, St. Giles's, in competition; new workmen's dining-rooms and other buildings, Isle of Dogs, for Messrs. Yarrow & Co., Ltd.; addition to the Technical Schools, East India Dock Road, for the Governors of the George Green Foundation; residences and quarters for the medical officers and staff, and other additions, at the Workhouse, High Street, Poplar; business premises, offices, also warehouses in Chelsea, Limehouse, Poplar, Millwall, Bromley-by-Bow, &c.

Mr. Clarkson had acted as District Surveyor for North Chelsea for over seventeen years when in 1903 he was appointed to the same position for the Royal Borough of Kensington. On taking up the new appointment he retired from private practice.

Mr. H. D. SEARLES-WOOD [*F.*] writes:—

A forty years' friendship with Clarkson has left an impression of a distinct personality. The ponderous body contained an alert mind; and a mordant humour, wide reading, and a good memory made him an interesting companion.

I look back on the memories of many happy hours spent in his society, first at St. Albans, where he lived with his mother, and at the Abbey where we used to browse, with Froude's *Annals of an English Abbey* in our hands, before Lord Grimthorpe earned the curse that concludes the essay, and since 1876 at every annual excursion of the Architectural Association.

Clarkson had a wonderful knowledge of England, and his maps and annotated and corrected Murray's Guide-books were most useful in making out the programmes for these excursions. One of his hobbies was to climb to the highest points in the districts we visited, and, bearing in mind his physical disabilities, the energy he displayed in this was characteristic of the man. After he got his breath at the top of the hill or tower, map in hand, he identified each place in the wide prospect, especially the high hills, and about each he had something interesting to say from actual personal experience

His biting humour was delivered in a mild voice, his head slightly inclined to the left and his eyes raised, and with an abstract look which gave the cutting words a peculiar force as he finished with a quiet chuckle, but there was no intended cruelty in the remarks, and during the forty years I have known him I have always been struck with his friendly feeling to all the architects that he came in touch with. He had a sound knowledge of his profession, with a real instinct for the archæological side, and all who associated with him will, I am sure, feel with me that in his death we have lost a real friend.

H. D. SEARLES-WOOD.

The late Samuel Douglas Topley [*A.*].

Mr. S. Douglas Topley, whose death occurred from pneumonia on 31st March, at the age of thirty-one, was the third son of the late Mr. Samuel Topley, of Blackheath. His professional education began in the Architectural School of the Goldsmiths' Institute, New Cross, and he was afterwards a student at the Polytechnic, Regent Street. From 1898–1901 he was junior assistant to Mr. Albert L. Guy [*F.*], from 1901–1905 assistant draughtsman to Messrs. Corbet, Woodall & Son, MM.Inst.C.E., from 1905–1907 assistant draughtsman to Mr. W. Henry White [*F.*], and from 1907–1909 chief architectural assistant to Messrs. Corbet, Woodall & Son. He passed the Special Examination of the R.I.B.A. and was elected Associate in 1910. He was afterwards associated in partnership with Mr. Paget L. Baxter [*A.*] at Palace Chambers, Bridge Street, Westminster. Works carried out by the firm include Orchard Cottage, Warlingham, Surrey; houses and cottages at Leiston, Suffolk, for the Leiston Gas Company; and show-rooms and offices at Norbury for the Croydon Gas Company. Mr. Topley was much interested in the political questions which have agitated the architectural profession in recent years. A clear thinker, an able speaker and debater, he took a prominent part in the debates at the Institute on the Registration and other questions. He was elected to the Council in 1914, and had done in that capacity much useful Committee work.

Members' Tribute to Mr. Topley.

Mr. E. Guy Dawber, *Hon. Secretary*, in formally announcing Mr. Topley's death at the Meeting last Monday, said: There is something inexpressibly sad in the death of a young man starting on the threshold of an honourable career. To most of us in this room Mr. Topley will be known by the remarkable ability which he always showed in debate. He took a keen interest in the affairs of the Institute, and especially in those matters relating to registration. He was a very keen opponent and an admirable debater, and yet he was always most punctilious and courteous. He had the courage of his opinions, and in this room and in the Council chamber he never hesitated to express what he thought, and what he felt was the right thing. The Council, who had known him for the last six months, found him a most able and willing worker. He helped on all the Committee work most energetically, and during the short time he had been with us he had won our deep esteem and our highest regard.

From Mr. R. Goulburn Lovell [*A.*]—

Topley represented the highest ideals as to the profession and of the Royal Institute. He strove for its domination outside and for the domination of its members inside. His first concern was for the absent member: the man who could not claim a hearing in debate had always his champion in Topley. By his logical mind and clear statement of facts he carried conviction whenever he expressed the views of himself and his supporters. His genial courtesy to friends and opponents in debate endeared him to all who knew him either intimately, casually, or only by his printed words. To his friends and to the Institute his loss can never be made good. His work was before him, and there is no one who can fill his place. To know him was to love him; to know of him was to respect him. To realise his loss is hard. The inspiring smile, the suavity of voice and graciousness of manners, will live long in the memory of those whose honour it was to know or even to claim an acquaintance with Samuel Douglas Topley.

From Mr. Herbert A. Welch [*A.*]—

The passing of poor Topley will, I am sure, be mourned by a great many members of our Institute. I had the pleasure of knowing him well, and his loss, at the very early age of 31, has come as a great shock and caused me deep grief. It was but a few months ago that he was fighting at meeting after meeting certain clauses of our proposed new Charter. His clear head and logical mind, as well as his splendid debating powers, were apparent to all who were interested. He fought strenuously in the cause he had at heart, yet never was he ungenerous or carping in his criticisms; on the contrary, he was most careful at all times so to express his views that he gave no cause for pain or annoyance to anyone. His future at our Institute was being watched by many of us with keen interest. He was a fine type of Englishman. Retiring and unselfish in disposition, he never failed to carry out what he felt to be his duty, no matter at what personal sacrifice. The Institute has lost a member who was deeply interested in its well-being, there are some among us who have lost an esteemed friend, but his influence will long be felt by those who knew him best.

From Mr. Ernest J. Dixon [*A.*], Hon. Sec., Guild of Architects' Assistants—

Douglas Topley will not be forgotten by those who have known the charm of his personality, his ideas or his methods. Supremely anxious to be accurate and sincere, ardently desirous of the conversion of mere dogma into reasoned conviction, deeply sympathetic with causes that others would have immediately abandoned on account of their infertility, but in which he saw justice struggling against adversity; in all these qualities of sterling character our dead comrade was as pre-eminent as he was esteemed. His ability and eloquence will be missed by all, and the loss of his counsel deeply regretted.

One who has felt the influence of a kindred spirit in the endeavour to spread unpopular notions, who has known the bitterness of isolation in principle and the difficulties of presenting a united front in the face of unyielding prejudice and apathy, can now bear testimony to the value of unselfish support and helpful interest. During five years of much strenuous work on the Council of the Guild of Architects' Assistants, Douglas Topley was foremost in all the activities of

that body. His comprehensive view of the Assistant's position and the memories of enthusiasm so often displayed against injustice, or of prejudice to future justice as shown in his attitude to some of the Registration proposals, cannot be lightly consigned to oblivion by his colleagues. Endowed with sincerity of sentiment and nobility of thought and expression, his defence of the Associate and the Assistant will be vainly demanded by a future which will lack an eloquent advocate and a tactful adviser.

The late Philip Webb.

The death is announced of Mr. Philip Webb, the architect, which took place on the 17th April at his residence, at Worth, Sussex. We are indebted to *The Times* for the following notice :—

Philip Webb was born at Oxford in 1831, the son of Charles Webb, a well-known doctor in that city. At the age of fifteen he was articled to an architect at Reading, with whom he served an apprenticeship of some four or five years. His father died in 1848, and on the termination of his articles young Webb obtained employment in the office of Mr. G. E. Street, then in Oxford and afterwards in London, with whom he remained as chief assistant for some years. While in Mr. Street's office he met William Morris, and formed the beginning of a friendship which was only severed by death.

Morris, then a young man with leanings towards the architect's profession, became a pupil of Street's, and although he soon abandoned the idea of becoming an architect, the friendship with Webb ripened under the influence of a common love of architecture and a perception that its study included more than was likely to be found in an architect's office. Both before and after the formation of the firm of Morris and Co. they did much work together ; among the early productions of this kind may be mentioned the adornment of the dining-room at South Kensington Museum, which was done about 1867 ; but before this, in 1860, Webb had built the Red House at Upton, in Kent, for Morris.

His growing private practice put an end to Webb's immediate connection with the firm of Morris and Co., but not to the fruitful influence which the friends had on each other's life and productions. Between 1860 and 1900 Webb built some fifty or sixty houses and one church, that at Brampton, in Cumberland, the uncompleted tower of which he designed after his retirement in 1905—his last piece of architectural work. One of his largest works was Clouds, the residence of the Hon. Percy Wyndham, near Salisbury, which was finished about 1886 and rebuilt after the fire in 1890. He built a large house for the present Lord Carlisle in 1868 at Palace Green, Kensington, another large house at Rounton, in Yorkshire, for Sir Lothian Bell in 1875, and many houses in Surrey.

He also made many important additions to old houses, a kind of work in which he delighted. One of these was a large addition to Forthampton Court, near Tewkesbury, in 1891. His work included, in addition, much decoration of various kinds, and he made many designs for wallpapers, tapestries, tiles, and other things. In all these he made most complete and often very beautiful drawings, often, too, making studies direct from nature. His designs may be said to echo mediæval styles, though never imitating any one in particular ; they showed always a stern dislike for trivial or meaningless ornament. With Morris he founded the Society for the Protection of Ancient Buildings. He also took some part in the Socialist movement during the years in which William Morris was making his bold fight for public reforms and was writing *John Ball* and *News from Nowhere*. Mr. Webb retired from business in 1900 and settled at the little village of Worth, where he occupied a cottage on the estate of Mr. Wilfred Blunt.

The funeral took place at Golders Green last Tuesday.

COMPETITIONS.

Whitehaven Housing Scheme.

In consideration of the following undertaking contained in a letter from the Town Clerk of Whitehaven, dated 30th March 1915 : " With regard to the appointment of the author of the design placed first as Architect of the buildings, the intention of my Committee has always been that the successful designer should be the Architect unless there was some objection to this being so "—the Competitions Committee of the Royal Institute of British Architets desire to withdraw the warning to members against this Competition which has been published in the Institute JOURNAL and the Professional Press.

IAN MACALISTER, *Secretary.*

14*th April* 1915.

MINUTES. XII.

At the Twelfth General Meeting (Ordinary) of the Session 1914–1915, held Monday, 19th April, at 8 p.m.—Present : Mr. Ernest Newton, A.R.A., *President*, in the Chair ; 24 Fellows (including 6 members of the Council), 23 Associates (including 2 members of the Council), 7 Licentiates, 1 Hon. Associate, and several visitors—the Minutes of the Meeting held 29th March 1915, having been published in the JOURNAL, were taken as read and signed as correct.

The Hon. Secretary, Mr. E. Guy Dawber, having announced the decease of Samuel Flint Clarkson (elected *Associate* 1869, *Fellow* 1885, placed on list of *Retired Fellows* 1910) and Samuel Douglas Topley, Associate-Member of Council (elected *Associate* 1910), it was Resolved, that the regrets of the Institute for the loss it had sustained by the death of its esteemed members be recorded on the Minutes, and that a vote of sympathy and condolence be passed to their relatives.

The decease was also announced of William Henry Duffield (elected *Associate* 1882, *Fellow* 1898), Ernest Day (elected *Fellow* 1889), and William Basil Stefanoni (*Licentiate*).

Mr. Segar Owen [*F.*] read a Paper on THE DESIGN AND CONSTRUCTION OF BUILDINGS FOR INDUSTRIAL PURPOSES, and on the motion of Sir William Lever, Bart. [*Hon. A.*], seconded by Mr. Matt Garbutt [*F.*], a vote of thanks was passed to him by acclamation.

The proceedings closed and the Meeting separated at 10.10.